

UC-NRLF



B 3 132 314

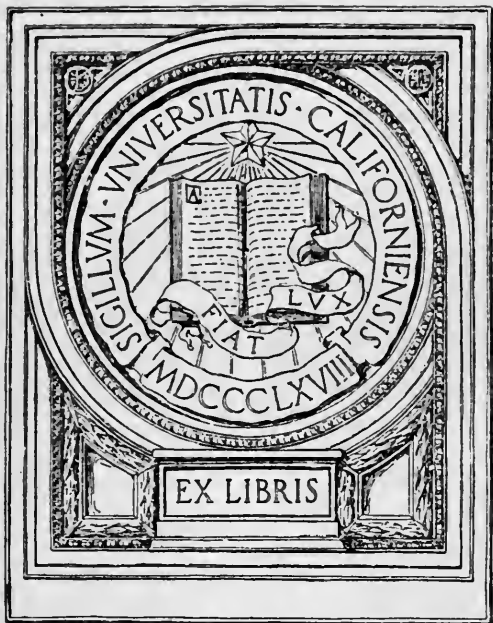
PREHISTORIC

- MAN -

—
JOSEPH McCABE



XXth CENTURY SCIENCE SERIES



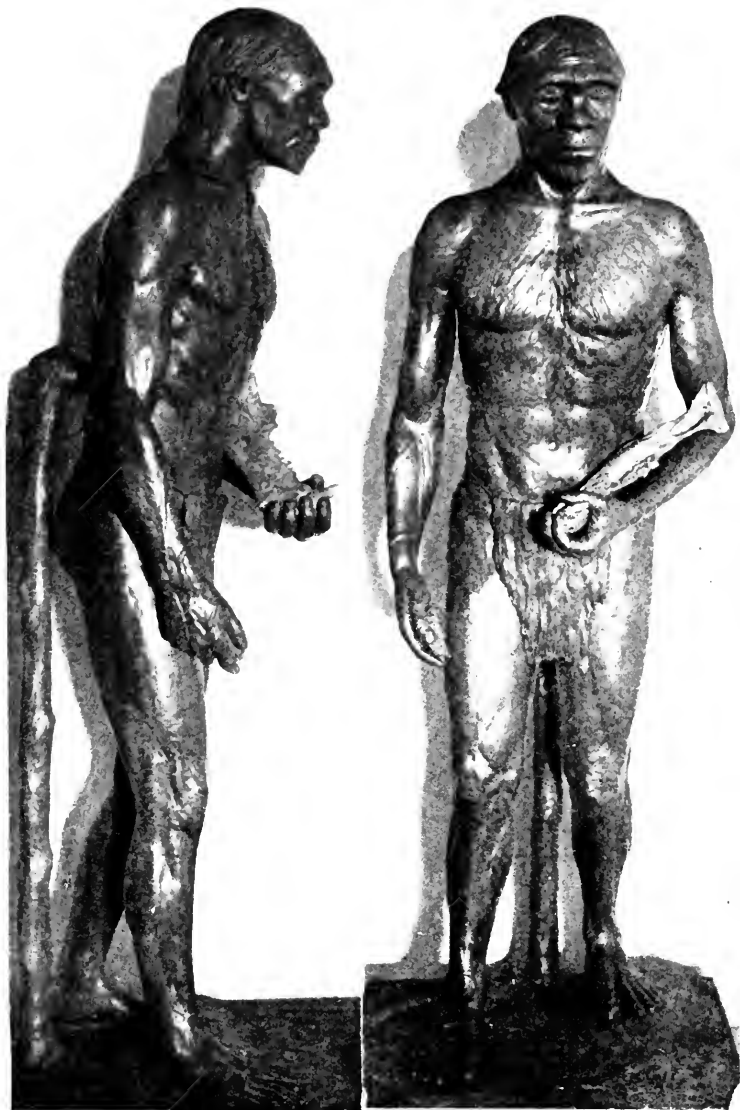
EX LIBRIS



Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation



Prehistoric Man



(Side view.)

(Front view.)

EARLY PALEOLITHIC MAN

(From the restoration by Richard S. Lull, Ph.D.)

PREHISTORIC MAN

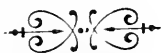
BY

JOSEPH McCABE,

Author of "Evolution," etc.

Translator of Fauth, Günther, Haeckel, etc.

Illustrated



NEW YORK
FREDERICK A. STOKES COMPANY,
PUBLISHERS.

GN 743
.MR

TO VMI
ANNOUNCED

PREFACE



FEW phases of the scientific doctrine of evolution have a greater fascination than the long story of the rise of man from his primitive level of stunted savagery to the fulness of modern civilisation. During a period of stupendous length man wandered over the earth without even the rudiments of culture. Our present knowledge puts the dawn of civilisation, in the valley of the Nile and on the heights above the valley of Mesopotamia, at about 10,000 years ago. But man had then existed on this planet during a period which hardly any competent student would now estimate at less than 100,000 years. In that long night preceding the dawn of history were slowly shaped the ideas and institutions from which civilisation would eventually issue.

To trace the lines of this gradual rise, to restore the forms and the habits of the strange races of men who spread over the planet, to indicate the causes of their progress or their halting on the upward path, is the aim of the present manual.

A kindly reviewer of the writer's previous contribution to the Twentieth Century Science Series ("Evolution") observed that it was so lucidly written that the reader might be tempted to regard the more speculative passages in it as established truths. This danger will be met, not by a sacrifice of lucidity, but by persistent care to distinguish stimulating conjecture from accredited fact. We

have, considering the very recent date of the science of prehistoric man, a really remarkable mass of direct relics of the earlier races of mankind; nor must we forget that, if we proceed with care, much can be learned from living races which have dropped out by the wayside on the upward march, and live to-day as our ancestors lived in the Old Stone Age.

Yet our knowledge is still fragmentary, and great care is needed, in putting together the mosaic of prehistoric life, to assign a proper value to each piece of evidence and each link of connecting speculation. In this little work, indeed, the author's chief concern is with the acknowledged facts and such general truths as are usually presented in the literature of the subject. That literature (English, American, French, German, and Italian) has been assiduously searched and compared by the writer, who has, in addition, examined many fine collections of prehistoric remains and implements, and has some personal acquaintance with the instructive labour of collecting them.

J. M.

CONTENTS



	PAGE
CHAPTER I.—THE FOUNDING OF THE SCIENCE ...	3
II.—THE EARLIEST TRACES OF MAN ...	17
III.—THE BEGINNING OF THE OLD STONE AGE	29
IV.—PROGRESS DURING THE OLD STONE AGE	46
V.—THE MEN OF THE NEW STONE AGE	63
VI.—THE MONUMENT BUILDERS ...	82
VII.—THE METAL AGE AND THE DAWN OF HISTORY 	101
BIBLIOGRAPHY 	117
INDEX 	121

The Publishers are indebted to Dr. Lull, The AMERICAN JOURNAL OF SCIENCE, The INDEPENDENT (New York), The Royal College of Surgeons, The Natural History Museum (South Kensington), The Trustees of the British Museum, and Messrs. Watts & Co., for permission to reproduce illustrations in this volume.

LIST OF ILLUSTRATIONS



	PAGE
Early Paleolithic Man ... ..	... <i>frontis.</i>
From the restoration by Richard S. Lull, Ph.D.	
Series of Prehistoric Skulls—Casts of (1) The Java Calvaria, <i>Pithecanthropus Erectus</i> ; (2) The Spy Calvaria, No. 1; (3) The Neanderthal Calvaria; (4) The Tilbury Skull; (5) The Engis Cranium	19
Early Paleolithic Remains—Skull-cap and Femur of Spy Skeleton	32
Series of Prehistoric Skulls—Java, Neanderthal Engis	51
Paleolithic Drawing—Reindeer Feeding—from the Grotto of Thayngen (Switzerland) ...	56
Neolithic Arrow-heads of Flint, from Ireland ...	82
Collection of Bronze Implements from Minster, Thanet	110

Prehistoric Man



CHAPTER I

THE FOUNDING OF THE SCIENCE

FEW sciences have offered so much difficulty to the fertile inventors of names as that which treats of prehistoric man. If, as is usual in scientific nomenclature, we try to compress the real description of it—the science of prehistoric races—into a compound Greek word, we get an uncouth term, *Palethnology*, which has not found general favour. Many French and German writers are content to call the science “Prehistory,” which is hardly more satisfactory. The two names in most common use are *Prehistoric Archæology* and *Prehistoric Anthropology*. Of these the latter is much to be preferred. *Archæology* is the study of a limited aspect of human products, generally within the historical period; and, though *Anthropology* has so wide a range as scarcely to be a distinct science at all to-day, it is precisely this comprehensive outlook which we cultivate in prehistoric science. We are to deal with every discoverable aspect of the life of man before the historical period opens.

Of far greater interest and importance than the question of name is the sharp struggle of the new-born science for recognition and independence. Until little more than

half a century ago, as the centenary of Darwin's birth reminds us, there was a general and deep-rooted conviction that the whole space of humanity's life fell within the narrow province of the historian, and with this conviction the accumulating discoveries of earlier remains had to maintain a long and heated conflict.

About half a century before the commencement of the Christian era, the Roman poet Lucretius had set out in verse a rough and imperfect scheme of evolution. Men had, he contended, slowly risen from barbarism to civilisation. An age in which men used only weapons of stone had preceded the age of metal; and Lucretius even made the fortunate conjecture that an age of bronze had preceded the age of iron. There was, however, so general a conviction that the story of mankind had opened with a golden age that the great truth propounded by Lucretius was almost entirely tossed aside until the nineteenth century. Some of the ancient Italian traditions, as well as the oldest Chinese traditions, had preserved the truth about early human history, but—from causes which it would be out of place to investigate here—nearly all the other races of mankind had the tradition of the primitive Golden Age. Not only did the classical poetry of Greece and Rome enforce this, but we find it in the sacred legends of India, Persia, Egypt, and Babylonia, and even in the ruder myths of our old Germanic ancestors and in those of the natives of America.

Passing over the occasional fruitless effort to revive the theory of Lucretius during the Middle Ages, we need note only two efforts to shake or evade the prevalent

conviction until the modern science began a direct assault on it. In the later Middle Ages a theory was advanced, and was widely discussed, that a strangely neglected race of men had been created before Adam, and that there were obscure references to their descendants in the earlier chapters of Genesis. It found some interested supporters when it was suggested that the negroes of Africa might be the descendants of these Pre-Adamites, and therefore not fully entitled to human rights, but the ingenious speculation was discredited and forgotten.

The next attempt was made by the earlier evolutionists at the end of the eighteenth and beginning of the nineteenth century. As is known, however, the efforts of Erasmus Darwin and Jean Lamarck met with little success. Sheer speculation beat harmlessly against the powerful barrier of universal prejudice. Only the discovery of positive evidence of the Stone Age would avail to make a serious impression on it. Such discoveries began to accumulate in the second quarter of the nineteenth century.

Stone implements of vast antiquity are strewn so liberally over the surface of the earth, or found in such quantities in the superficial beds which are often disturbed, that one may wonder how the old idea had survived so long. In point of fact, these implements were quite well known. Arrow-heads and heavier hand-implements of stone had been picked up from time immemorial. One might very well ascribe them to early Britons, without going outside the range of history; and there were also the "antediluvians" and the "fairies" to whom one might, and often did, attribute them.

Travellers of grave repute have described how these small arrow-heads were shot at them by unseen hands in the England of their time. In Scotland the prehistoric axe-heads which were taken from Neolithic graves were popularly known as "Purgatory-hammers," or the implements with which the dead man was to knock at the doors of the nether world. In the Vatican Museum itself there have been Paleolithic implements, of vast antiquity, for three centuries.

These implements could not be properly interpreted until geology was in a position to discuss the situation in which they were found, and no sooner was the science established than genuine discoveries of prehistoric relics began to be announced. Geology began to claim the earlier chapters of humanity's life as belonging, not to history, but to the scientific explorer of the earth's crust, and a few ardent students in France, Belgium, and Denmark devoted themselves to special inquiry on the subject.* Between 1827 and the middle of the century a number of finds were reported. In 1836 a Danish student, Thomsen, determined by positive evidence the successive ages of stone, bronze, and iron, which are especially clear in Denmark. Several human bones of great (but disputed) antiquity were discovered among the bones of long-extinct animals, the exploration of the floors of caverns was conducted with great zeal, and the question of "fossil man" was agitating the scientific world. Unfortunately great geologists like Cuvier clung

* In this country Mr. John Frere had in 1797 ascribed the flints he found at Hoxne to a very remote race, without the use of metal.

to the old prejudice, and the discoveries were treated with disdain; in some cases most valuable remains have been wholly lost.

By the middle of the century the new science began to gather strength. In France the struggle centred about the discoveries of Boucher de Perthes, a retired physician, who had for some years been collecting implements in the deposits of the valley of the Somme. These deposits were at that time known in geology as the "diluvium," or the material heaped together by the Deluge, and Boucher de Perthes approached them with the innocent intention of searching for traces of "antediluvian man." In 1847 he published his discoveries in a work which he called *Celtic and Antediluvian Antiquities*. The prejudice which he encountered drove him to more vigorous search, and he soon discovered, and announced, that the flint implements of Abbeville belonged to a race of men far anterior to the supposed antediluvians. By 1859—when, it is interesting to note, our English geologists (Sir) Joseph Prestwich and (Sir) John Evans, intervened with great effect in his favour—the battle was virtually won and the science accredited.

In the meantime (1856) a most important discovery had been made in Germany. In the Neanderthal (or Neander Valley), near Düsseldorf, some workmen found a peculiar type of human skeleton in the course of their excavations. A student of the new science managed to rescue some of the chief bones, including the cranium, and they are now on view in the Düsseldorf Museum. It is now universally recognised that these bones belong to the earlier part of the Old Stone Age, and that they

are typical of the race of men which then peopled a good part of Europe. Even in 1856 geologists had to allow that the bones lay in a bed of very great antiquity, and that the type of skull was at or below the level of the lowest savagery. The search in caverns and superficial deposits went on more ardently than ever. In 1863 Sir Charles Lyell gathered together the scattered finds, and enforced the moral, in his *Geological Evidences of the Antiquity of Man*, and in the same year Huxley extended the doctrine of evolution to man, in his famous *Man's Place in Nature*, and so provided a rational framework for the new discoveries. Darwin had, it will be remembered, published the *Origin of Species* in 1859. As the doctrine of evolution gained adherents, the old prejudice slowly died.

In 1854 Keller had announced the discovery of the Neolithic pile-dwellings in the Swiss Lakes, but the next great controversy broke out in 1867. In 1859 Broca had founded the Anthropological Society at Paris, and in 1865 G. de Mortillet inaugurated the International Congress of Anthropology and Prehistoric Archæology. To one of these congresses in 1867 came a French priest, the Abbé Bourgeois, with a story that he had found worked flints in Tertiary strata at Thenay. The Tertiary period of the geologist suggests an epoch so remote that these rude flints aroused a passionate discussion. I may say at once that they are not admitted by the majority of modern authorities, though at the time the majority of the scientific commission, to whom they were entrusted, declared them to be of human workmanship. The man of the Old Stone Age was now

freely accepted. The question was whether the story did not run back to a much older period: whether we ought not to admit "Tertiary Man."

It would be superfluous to trace the growth of the science from 1870 onwards. Geologists and anthropologists continued to occupy themselves with the inquiry, but it was now the theme of a special science, with groups of special students and technical magazines and literature in every advanced country. In Germany the science was long hampered by the authority of Rudolph Virchow, President of the Anthropological Society, who carried with him to his grave a strange and unreasonable prejudice against evolution. In England, France, and Scandinavia, the science has for decades had able leaders and an ample literature. Italy, Belgium and Switzerland are hardly behind these countries; and Spain and Austria have reported some remarkable discoveries in recent years. Both North and South America have their workers and literature, and the research has now been carried to some extent all over the civilised world. The advance of the science becomes too large for summary. In the course of this work the reader will find evidence enough of its vast activity in all countries, and of the voluminous literature it has created.

From the enormous accumulation of material which half a century of research has given us, we are now able to sketch the general outline, and fill in much detail, of the prehistoric life of humanity. Even if we had found no human remains whatever, we should have ample proof of the gradual rise of man from a lowly level to

the threshold of civilisation. From roughly worked stones, in which we barely recognise the artificial chipping that fitted them for primitive man's uses, we pass through slow and steady stages of improvement in workmanship until we reach a period of finely polished stone axes and delicately chipped arrows and lance heads. After these we find man experimenting in copper—the first available metal that would meet his eye—and passing quickly to the use of bronze, the harder alloy which an intelligent being would soon devise. Lastly, in the full dawn of history, we meet weapons and implements of iron.

But we are by no means restricted to these imperishable memorials of man's handiwork, which so fully illustrate the gradual rise of human intelligence. We have now a very fair collection of actual human remains of the prehistoric age, and they are in entire accord with the conclusion we draw from the stone implements. Of the men of the early Stone Age we have now about ten important skulls or jaws, with many other bones. We shall see that these exhibit a human type of the very lowest level known to us; though we shall have to consider certain bones found in Java which recall an even lower and much earlier level. The few remains we have of the men of the later Old Stone Age show just such an increase in cranial development as our study of their handiwork would suggest, and this improvement is maintained when we rise to the New Stone Age. For the later period the remains are, of course, abundant. In a word—as will be seen by a glance at the photographs I have taken—we have only to place these skulls

in a chronological series to perceive at once the ascending character of the story of mankind.

The succession of stone and metal ages is now beyond cavil; though, as it is hardly needful to say, the stages often coexist in the sense that one race may remain at the earlier level while another pushes forward to a higher stage. Many savage tribes were still in the Old Stone Age in the nineteenth century. Some (such as the Tasmanians) remained until their extinction, thirty years ago, at one of the very lowest levels of primitive culture. The study of savages is, in fact, a most instructive parallel to the study of prehistoric races. Just as many a noble family may look back on the ranks of the workers as its original level, civilised peoples may look back on more primitive races. They are fragments of the early waves of distribution of the human family, retaining in their isolation the characters of human life as it was for all in a remote antiquity. Some of them have still the low type of skull and the crude stone weapons of the earliest prehistoric man.

But in the arrangement of so vast a mass of material and so extended a period of time we need many secondary stages, and the original division of the Stone Age into Paleolithic (Old Stone) and Neolithic (New Stone—polished or more finely chipped stone) is now much subdivided. In the first place many high authorities admit the marks of human workmanship in certain stones which go back far earlier than the beginning of the established Paleolithic period. For these stones, which we will presently consider, the name "Eoliths" (earliest stones) has been invented, and the remote

period to which they belong is known as the Eolithic period. M. Rutot, the great Belgian authority, arranges them in three stages—the Reutelian, Mafflian, and Mesvinian.

The Paleolithic period has, until recently, usually been divided in England into two broad sections—the (earlier) age of the River-drift men and the (later) age of the Cave men. In the sense that the older Paleolithic men seem to have lived predominantly in the open air, and left their implements chiefly in the gravels of the broad rivers of the time, while later Paleolithic men dwelt mainly in caves and rock-shelters, the distinction has a broad value. But it is fairly clear that man sometimes inhabited caves from the start, and other divisions are now adopted. It is usual to admit three stages in the earlier Paleolithic, the names of which are taken from the French sites where we find them best exhibited—the Chellean (from Chelles), the Acheulean (St. Acheul), and the Mousterian (Le Moustier). Advanced students, like M. Rutot, add an earlier stage (the Strepyian); others subdivide the Chellean and Acheulean, or combine the two; and others again assign the Mousterian to the later Paleolithic. These refinements may be ignored until later.

The upper and later Paleolithic is divided into the Solutrean and Magdalenian, the names again being borrowed from typical French sites (Solutré and La Madeleine). We thus get five main divisions of the Paleolithic, which correspond to different levels of culture and to significant modifications of climate and animal population. Until recent years the Paleolithic

was sharply divided from the Neolithic, but transitional types have now been discovered, and most writers interpolate a Mesolithic (Middle Stone Age) between the two. This is often called the Azilian (from Mas d'Azil). We then have the Neolithic—a period characterised by the finer working, and often the polishing, of the implements. This again has its subdivisions, as have also the metal phases which follow it. All these sub-divisions and their meaning will be fully explained as we reach them, but it will be convenient to draw up now a scheme of the entire series for reference. In order not to confuse the elementary student I omit the more contested and finer subdivisions.

PHASES OF PREHISTORIC DEVELOPMENT.

Eolithic ...	Rutot's ...	{	Reutelian Mafflian Mesvinian
Paleolithic ...	Earlier ...	{	Chellean Acheulean Mousterian
	Later ...	{	Solutrean Magdalenian
Mesolithic ...	Azilian		
Neolithic ...			
Copper ...			
Bronze ...			
Iron ...		{	Hallstatt La Tène

The relation of these periods to the periods of the geologist may be briefly dismissed. The geologist divides the entire series of stratified rocks in the earth's crust into four periods. The first and longest of these (the Primary) closes with the beginning of the great age of Reptiles (Permian) after the Coal-forests. The Secondary closes with the deposit of the Chalk. If we take the entire story of the stratified rocks to extend over 55 million years—a moderate estimate—these two periods will occupy 49 millions out of the 55. There is, of course, no question of human or even ape remains in either of them. The Tertiary period (on this scale) will then occupy about $5\frac{1}{2}$ million years, and the Quaternary (or actual) about half a million. There is no question but that the presence of man can be traced even in the earlier part of the Quaternary, but all evidence that is claimed for the Tertiary is much disputed, and, as I shall have frequently to refer to its subdivisions, it will be convenient to give them here in schematic form:—

THE LATER GEOLOGICAL PERIODS.

Quaternary ... (or actual)	{	Holocene (or Recent) Pleistocene
Tertiary ...	{	Pliocene Miocene Oligocene Eocene

Lastly, since I have made allusion to chronology, a word of warning must at once be given to the reader.

In geology generally, and in prehistoric science especially, all chronological schemes must be regarded with great reserve. I take 55 million years as a fair average estimate of the time it took to form the stratified rocks of the earth's crust, but a few eminent geologists would halve this (the lowest estimate), while many would double or multiply it. So in regard to primitive man Any estimate which falls short of 100,000 years since the beginning of the Paleolithic period may be ignored, but it is difficult to go beyond this. One of the most careful estimates (that of Mortillet) assigns 250,000 years for the whole story since the advent of Paleolithic man, but many eminent authorities would double this. Sir W. Turner has recently claimed that it is at least 100,000 years since the beginning of the Neolithic age, and it is generally agreed that the Paleolithic was at least two or three times as long as the Neolithic. Dr. Keane claims at least 500,000 years for the earliest undisputed human traces, and one of the latest German writers, Dr. Hoernes (*Natur und Urgeschichte des Menschen*), speaks of the appearance of man at least a quarter to half a million years ago. If the Eoliths are admitted, the period must be greatly prolonged, while the Ape-man of Java is generally admitted to go back to the Tertiary period.

The reader will conclude that we have by no means as yet the material required to settle the question of chronology, and will dispense me from pausing at the various phases of evolution to say "whence these things were." It is enough to say with Sir John Evans, one of the most cautious authorities: "The mind is almost

lost in amazement at the vista of antiquity displayed." If we can succeed in restoring the outline of some of the strange races of men who roamed our planet with strange animal companions in the dark night of pre-history, we may leave the closer determination to a more developed science. To that task I now apply myself.

CHAPTER II

THE EARLIEST TRACES OF MAN

THE very fact that man has ascended gradually from an animal level implies that any very early traces of him which we may find will lend themselves to almost endless controversy. If we find remains of the being who is slowly assuming human shape, it will be quite natural that many will hesitate whether to describe the transitional form as animal or human. If we find specimens of man's most primitive efforts to give an edge to a flint, the marks will differ little from the chipping to which flints are subjected in the river-bed or on the shore of the ocean. It is not surprising, therefore, that the claims for the most primitive traces of man are much disputed; and, since this little manual is not controversial but educative in aim, these disputed traces must be simply described, and the marshalling of authorities, for or against their human character, briefly indicated.

The most important of these controversies centres about some remains that were found in the island of Java in 1891 and 1892. Dr. Eugène Dubois was investigating some fossiliferous deposits at Trinil (Java), and he discovered four bones of singular interest—a skull-cap, a thigh-bone, and two teeth. The bones were not found together nor at the same time, but all belong to the same deposit, and were only separated by a dozen

yards. Dr. Dubois produced them at the International Zoological Congress at Leyden in 1894, and claimed that he had discovered the "missing link" in the chain of man's evolution. The skull proved to have a cranial capacity of about 900 or 950 cubic centimetres. This capacity is just midway between that of the highest ape (600) and that of early Paleolithic or low savage man (about 1200). The eye-ridges were prominent and powerful, the forehead very low, and the whole appearance singularly brutal. The teeth are not less removed from both the human and ape type. The thigh-bone, though nearer to the human type, is conspicuously curved and twice as heavy as an ordinary human femur.

There was a long and heated discussion at the Leyden Congress on the character of the being to whom the bones belonged, and the issue was instructive. Of twelve experts present, three declared them to be the remains of an abnormal man, three regarded them as bones of an unknown and advanced man-like ape, and six said that they were of the intermediate type which Dr. Dubois claimed. The minority which claimed them to show a degenerate human type was led by Professor Virchow, whose prejudice on the subject of evolution was well known. In the previous year he had, at the Vienna Anthropological Congress, gone so far as to declare that "man might just as well be said to have descended from the elephant as from the ape." His objection—that the bones showed pathological degeneration—has not been sustained, and the latest German writer on the subject, Dr. Hoernes, declares it to be absolutely groundless.

By 1899, Professor Klaatsch tells us, only three out of eighteen authorities ascribed the skull to an ape, nine to a man, and six to an intermediate being. As Dr. Hoernes observes, the conclusion is clear. A being which experts could class as either ape or man or intermediate between the two is obviously intermediate, and it is now the usual practice to speak of it as the erect Ape-man (*Pithecanthropus erectus*) of Java. It seems to be one of those semi-human, semi-ape types which the theory of evolution places before the definitely human type. It does not follow, however, that we may insert it in the line of man's ancestry. It may represent some collateral branch of the Primate family, which was extinguished before it reached a human level. Its great interest is that it exhibits a type high above the level of the most advanced ape, a type in which we certainly find the beginning of human characters. In our chief museums (Natural History Museum, Royal College of Surgeons, etc.) the cast of the skull is definitely ranged as early human.

The question whether the skull-cap, femur, and teeth (which were found at intervals of several months) belonged to the same individual is not very important, since the skull alone suffices for our purpose, but the close association of the bones at the same horizon, and the peculiarly transitional character of all of them, dispose us to think this. More important is the question whether the bones really belong to the Pliocene period, to which they are referred. If they do, a very great antiquity would be demanded. Some hold, however, that the bones do not belong originally to the bed in

which they were found, and a recent geological investigator has even claimed that the bed itself is not Miocene, but mid-Quaternary. Final decision must be reserved, though the very low organisation seems to point to the earlier date.*

There is a further point to be considered before one can venture to build any large structure of speculation on so slender a basis. From the organisation of a single individual we must not hastily conclude that we have the typical organisation of the species to which it belonged. Especially in brain-capacity individuals of the same small community vary immensely, and we must study a number of skulls to get the average of the group. No doubt the variation is much greater to-day than it was in primitive times, but the point must not be neglected. In the case of Paleolithic man we have a number of skulls, from different parts of Europe, and from them we gather the typical Paleolithic form. We must remember that we have as yet only one skull of this very primitive species, and refrain from large generalisations. I may add, however, that the early Paleolithic skulls vary much less than skulls do in a modern community.

With these reserves we may attempt to picture to ourselves the kind of being who roamed over the islands or the "lost continent" of the Indian Ocean at that remote date. From the thigh-bone we gather that the Pithecanthropus was a few inches over five feet high, and stood erect, though retaining a strong curve from a

* An expedition was sent out from Germany to Trinil in 1906, and vast material has been collected. The results of this search may modify earlier conclusions.

quadruped ancestor. From the skull and teeth we clearly gather a face intermediate between that of the chimpanzee and that of the native Australian—a heavy, bestial face, with great arches over the eyes and retreating forehead, with bulging teeth and massive jaws and receding chin. Powerful in muscle, stunted in brain, probably (from reasons we shall see later) covered with a thick coat of hair, the Pithecanthropus is just the type of creature that the doctrine of evolution would place at the end of the Tertiary period. The earliest ape-like creatures, the Lemurs, appear in the Eocene. The man-like apes appear in the Miocene. Pithecanthropus, if assigned (as is usual) to the late Pliocene, comes midway between the highest fossil apes and Paleolithic man (in the Pleistocene); and this is precisely its position in organisation.

From any larger or more speculative conclusions I must entirely refrain here. In my earlier manual (*Evolution*, ch. vi.) I have summarised the most recent speculations on the evolution of man, and suggested the causes of his upward advance. Where that important evolution took place we do not know. Dr. Keane confidently looks to the neighbourhood of the Indian Ocean (where, as we know, much land has disappeared under the waves) for this cradle of humanity, but the evidence is slender. In view of the distribution of the man-like apes in Africa and Asia (and formerly in Europe) it is not unnatural, and the finding of the Java bones may be held to confirm it. But this supposition is much complicated by the next claim of early human traces, which we have now to consider.

We turn now from human remains to the relics of human workmanship, and we shall meet all the obscurity and controversy which I explained to be inseparable from the earliest artificial touches. I will first run briefly over certain disputed flints, which are claimed to be the work of Tertiary man, and then deal with the more weighty of the English "Eoliths."

In the preceding chapter we saw that a French priest, the Abbé Bourgeois, candidly brought before the International Congress in 1867 certain flints which he believed to bear traces of human workmanship. They exhibited a network of fine cracks which could only be due to heat, and it was suggested that they had been put into fire to split them—a procedure that we find among certain savages to-day. In addition, many of them had a series of chips along the edge, which were claimed to show design and purpose. Apart from the crude character of the flints, however, the fact that they were found in Miocene beds made the majority decline to recognise them. They were found in the district of Thenay, about sixteen feet below the present surface, and the period to which they were referred was one so remote that palms then flourished in Northern France and crocodiles swam in its rivers.

The controversy which ensued is no nearer a close to-day than it was forty years ago. Eminent authorities like Sergi and Mortillet accept them as the work of Tertiary man: other authorities entirely reject them: the majority of experts maintain a reserve of opinion. The situation is typical for the whole of the claims of Tertiary traces of man, and I need not do more than

enumerate the disputed "finds." Certain flints were found in Tertiary strata at Otta in Portugal. Mortillet and others regard them as genuine worked flints of the upper Miocene, but the great majority of the authorities are against them. The flints of Puy-Courny are in the same position (admitted by Keane, Rutot, Klaatsch, Mortillet, and others), and there is the same division of authorities in regard to all the alleged finds of "Eoliths," or pre-Paleolithic implements, in Africa, India, and all parts of Europe.

The difficulty is natural. On the one hand, we can point to tribes like the extinct Tasmanians which gave no more finish to their stone implements at times than is seen in many of the Eoliths; on the other hand, many authorities believe that the accidental chipping of flints in nature leads to forms quite analagous to those of the Eoliths. It is precisely the situation we would expect. Tertiary man—and most of the authorities agree that the human stage was probably reached in the later Tertiary—would have so feeble an intelligence that his handiwork would hardly be demonstrable.

I pass entirely over certain scratched or cut bones from Tertiary deposits, and the skulls and other remains once referred to the Tertiary in California (the Calaveras skull, etc.) and now claimed in South America. Few are willing to consider these claims to-day. Other Eoliths, found at Boncelles, are actually referred by their supporters to the Oligocene—a period, on a moderate estimate, four or five million years ago—and are said to be already fashioned into knives, borers, etc. The Eoliths of Aurillac are referred to the Miocene,

All these and the whole Eolithic scheme of M. Rutot (the most ardent Eolithist, and the leading Belgian authority) are generally regarded with reserve, or rejected outright.*

The English Eoliths call for somewhat fuller notice, and have a much greater weight of authority behind them. The classical examples of these flints, for which human use is claimed, are those found by Mr. Benjamin Harrison in the neighbourhood of Ightham, Kent. In the patches of gravel which are scattered over the surface of the North Downs a number of flints were discovered which seemed to have been used, and in some cases deliberately adapted, for the purposes of a very primitive race of men. The safe and ordinary marks of human workmanship, which we shall see later, were lacking, but this defect would be quite in harmony with the reputed age of the implements. Some were believed to show signs of wear, others had the appearance of scrapers or borers, and others again had a roughly chipped edge. Similar implements have since been discovered in large numbers near Salisbury, in Dorsetshire and Essex, and in Belgium, France, Germany, North and South Africa, and India.

* See, for full particulars, Mortillet's *Préhistorique* (p. 25-126), and Hoernes' *Natur und Urgeschichte des Menschen*. A good discussion is found in an article by Professor Sollas (who admits many of Rutot's Eoliths) in *Science Progress*, January, 1909. Another excellent summary is found in Dr. Windle's *Remains of the Prehistoric Age in England*, 1904. For a recent attack on the English Eoliths, by Mr. Worthington Smith, see *Man*, 1903, p. 26. Fuller treatment is found in G. G. MacCurdy's *The Eolithic Problem*, 1906.

It would be impossible here to discuss these stones in a manner sufficient to enable the inexpert reader to form a judgment on them. The highest expert opinion in the world is still greatly divided on the subject of their intelligent use. The earliest convert to Mr. Harrison's view of the Kent Eoliths was Sir Joseph Prestwich, a very cautious authority, who had hitherto been reluctant to admit the larger claims for the antiquity of man. On many of the specimens in the large collection at the Natural History Museum at South Kensington the visitor will notice a small paper disk. This was put on them by Sir J. Prestwich to denote the flints which, in his opinion, were genuine Eoliths. He further determined that they had been rolled to their present bed on the plateau of the Downs from a high hill (2,500 feet) which has since been entirely removed by denudation; and he thus assigned them an incalculable antiquity. That they have been thus rolled in the bed of a river which no longer exists is agreed—they bear obvious traces of the process—but it is still very keenly disputed whether we may attribute them to human beings.

While Dr. Keane, Lord Avebury, Sir E. Ray Lankester, and other high authorities accept the Eoliths, equally good authorities like Mr. Worthington Smith emphatically reject them. Sir John Evans was their principal opponent during his life; though it is curious to find him saying in 1902 (as quoted by Mr. Newton in *Man*) that Mr. Harrison's "numerous and important discoveries" had "done much to revolutionise our ideas as to the age and character of the drift-deposits capping the chalk downs in West Kent." One may say that the

Eolithic position gains ground in England, and is favoured by the majority of the authorities. On December 1st, 1908, Professor A. Schwartz and Sir Hugh R. Beevor read a paper on the subject at the Literary and Philosophical Society of Manchester, and claimed to demonstrate the human purposiveness of the Eoliths. Since Dr. Blackmore began his investigations in the district of Salisbury the position has been much strengthened. We now find a conservative writer like Dr. Windle not only accepting the Eoliths, but adding that "the question of the Pliocene date of the Eoliths must be regarded as settled."* On the Continent Mortillet, Rutot, Klaatsch, Schweinfurth and others accept, but a large number of the chief authorities in France and Germany refuse to recognise any Tertiary traces of man, while generally allowing that man was probably evolved in the Tertiary period.

As far as the Tertiary period is concerned, therefore, we must say that no undisputed trace of man is discoverable, but that a very large number of the leading authorities (Keane, Lord Avebury, Sir E. Ray Lankester, Rutot, Mortillet, Klaatsch, Sergi, etc.) admit such traces in England, France, Belgium, Spain, and Italy, or some one of these countries. The question must remain in reserve. In view, however, of the high authority now quotable in support of Tertiary man, it will not be without interest to discuss his relation to the general development of the earth.

Europe enjoyed a semi-tropical climate in the Miocene

* *Remains of the Prehistoric Age in England*,
p. 7 (1904).

period, to which the earliest and most disputed traces of man are referred. Palms flourished as far north as the region which is now the north of France and the south of Britain; though at that time the British Isles were not separated from, but formed part of, the Continent. Large man-like apes lived as far west and north as France, and it is not impossible that the precursor of man was amongst them. As his intelligence developed—possibly through his having been forced to leave the trees, adopt the erect posture, and use his fore-limbs as hands—he would (on the analogy of the ape) use weapons of wood, torn from the trees, or throw stones. Of such early wooden weapons no trace could possibly be preserved, on account of the corruptible material.

The next step would be to select stones which were naturally adapted for his primitive needs, and from such selection to the rough chipping of the stones, to give an edge or a point, would be a natural transition. Theoretically, we should be disposed to place this step in the Pliocene period, and it is precisely to this period that the bones of the Ape-man of Java and the Eoliths are generally referred. From the rough nature of the workmanship we cannot demonstrate the presence of intelligent fashioning, but the Tasmanians and the Andaman Islanders were found in the nineteenth century to work the stones they used in just the same crude way.

If we accept these traces as genuine, therefore, we have a lowly type of human being, midway in brain and frame between the Chimpanzee and the Australian savage, wandering on foot into what is now the island of Britain, and

living, in a genial climate, along the banks of its broad marshy rivers, with the hippopotamus, rhinoceros, tiger and hyena for neighbours. From some cause which is not yet established, the climate was growing colder. Northern Europe was preparing for the vast mantle of ice which would presently cover it. The palms and the tropical animals were retreating southward, and man, not yet intelligent enough to adapt himself to the colder climate, may have retreated with them. As the Miocene period ends, the glacial ice-streams begin to descend from the more northern or the higher mountains, and in the first part of the Quaternary period nearly the whole north of Europe (down to the Thames and Danube) and of North America was covered with a great ice-sheet.

Here, however, we come to the Old Stone Age proper, and must describe the earliest undisputed remains of Paleolithic man. Eolithic or Tertiary man awaits the final decision of science. Fresh material is being constantly accumulated, and a few more years may see the question settled. Important discoveries are announced from Scotland, where even Paleolithic man had not hitherto been admitted; and I have myself examined a remarkable collection of crude Paleoliths from the upper valley of the Lea (where, in spite of the assertion of some writers, implements are very abundant) which may turn out to have very great interest in linking the Eolithic with the Paleolithic. It is enough here to describe the position of the controversy and the theoretical course of man's evolution. Now we reach surer ground as we turn to consider the relics of early Paleolithic man.

CHAPTER III

THE BEGINNING OF THE OLD STONE AGE

THE student of evolution may feel some impatience that we skip from one definite period to another, instead of following a completely graduated series of human stages from the first appearance of man to the dawn of history. Many authorities believe that we can already trace this perfect sequence in the stone implements of early man, and that we can pursue the slow growth of art through the Eolithic, Paleolithic, Mesolithic, and Neolithic periods. We have not only the strong claims already mentioned on behalf of England and Belgium, but Schweinfurth believes he has traced the sequence in Egypt, and Mr. J. P. Johnson (*The Stone Implements of South Africa*, 1907) for South Africa. No one questions that the evolution is continuous, but, not only are the earlier stages open to disputes as to identity from the very nature of the case, but the great changes of climate, which took place in the northern hemisphere, would cause such migrations that we have little hope of finding a perfect succession in any one locality.

On the other hand, when we bring together different strata of culture from different localities, it is difficult to determine their chronological relations with confidence. As time goes on we find all the different

stages existing simultaneously in different regions. In the middle of the nineteenth century every single stage of human culture—from Eolithic to advanced civilisation—was discoverable at some point or other on the earth's surface. The tracing of the perfect sequence is, therefore, a task of the future. For the present we may be content to sum up our knowledge of the early Paleolithic race, or races, of men.

What we do know is that in the earlier half of the Quaternary period, vastly earlier than the first dawn of history in Egypt 10,000 years ago, human beings wandered over the greater part of Europe, and possibly Southern Asia and Northern Africa. They were below the cultural level of the Australian native. Their beetling eye-ridges, retreating foreheads, heavy chinless jaws, and protruding teeth, are quite in accord with their stone implements, and betray a very low level of mental culture. They had no agriculture, no bows and arrows, no tamed cattle, no pottery, no woven texture, and probably—as we shall see—no clothing and no articulate speech. In the enormously long period of the Old Stone Age (which is generally computed at something over 100,000 years), the only progress they made consisted in preparing their stone weapons and tools with a finer process of chipping; this, at least, was the only progress made during the greater part of the period. From the earliest remains found, these men are given the name of the Neanderthal race.

The general physical and mental character of this race is now firmly established. I have already referred

to the finding of a prehistoric skeleton at Neanderthal, near Düsseldorf, in 1856. When the rescued bones came to be examined, it was found that they belonged to an extraordinarily primitive type of man. All controversy as to the normal human character is now over, and the skeleton is admitted to be that of a man of the early part of the Old Stone Age. The thigh-bones were very heavy and much curved, and they and the other bones indicated very powerful muscles and a very moderate height. The man stood about 5 feet 3 inches, his legs slightly curved, and his limbs and chest of great power. His large teeth bulged outward, and there was little chin. Two thick bony ridges stood out far over his eyes, and his forehead was extremely low. The skull might contain 1,220 cubic centimetres of brain matter, which is much the same as that of an Australian native. Some writers have represented that this is a fair capacity for a man of 5 feet 3 inches, and greater than that of many Veddahs and Andamanese. The latter, however, have very slight frames to control, unlike the Neanderthal man. As Huxley said, the skull was "the most brutal of all human skulls" at the time it was discovered.

Since the middle of the last century, however, we have discovered other remains of early Paleolithic man, and we know that the Neanderthal individual is a fair specimen of the race to which he belonged. The next most important discovery was at Spy, in Belgium. In 1886 two Belgian students explored a grotto at Spy, and, in the terrace before it, two or three feet below the actual surface, they found two fairly

complete skeletons of the Neanderthal type. One skull is slightly better than the other (which some authorities attribute to difference of age), but both have the heavy frontal ridges, and the low, retreating forehead, the powerful chinless jaw, and the bulging teeth of the Düsseldorf skeleton. The men were evidently adults, but the mental capacity was low, and the great mass of the brain was thrown behind. The thigh-bones were thick and curved, and they and the other bones indicated very powerful muscles. We had the same suggestion of a squat, powerful, stunted savage, with brain and facial features going back toward those of the ape.

Every fresh discovery has confirmed this suggestion. In Belgium, again, at La Naulette, a lower jaw was found which has been accepted as early Paleolithic. At Malarnaud and Arcy in France other jaws were discovered, and the latter, at least, is recognised as early Paleolithic; the former is generally admitted. In England a skeleton found at Tilbury (at a depth of 32 feet) during the excavation for the docks in 1882, a fragment of a skull found at Bury St. Edmunds in 1884, and a skull and other bones found at Galley Hill (Kent) in 1888, have been attributed to the same race. It is more probable, however, that these remains belonged to the later Old Stone Age, and we may postpone them until the next chapter. The same must be said of finds at Predmost and Podbaba (Moravia), Brůx (Bohemia), Schipka (Moravia), Taubach (Germany), Eguisheim (Alsace), Engis (Belgium), and Gibraltar. They seem to belong to the Paleolithic race, but not to its earlier section.



EARLY PALEOLITHIC REMAINS (Skull-cap and Femur of Spy Skeleton).
Photographed by the Author at the Royal College of Surgeons.

On the other hand important discoveries have been made in recent years, which fully confirm the type suggested by the relics of Neanderthal, Spy, Arcy, and La Naulette. The first of these occurred at Krapina, in Croatia, where nearly 500 human teeth and bones (or parts of bones) were found, in 1899, in association with animals (arctic and cave-bear, woolly rhinoceros, beaver, etc.) of an interglacial character. Patient reconstruction yielded the remains of at least two individuals of the Neanderthal type, the jaw-characters approaching even nearer than those of Spy to the most primitive standard.

More recently finds of great importance have been made in France and Germany, and the character of early Paleolithic man may be regarded as fixed. In 1906 a Swiss explorer, Hauser, found a nearly complete skeleton at La Vézère, in the Dordogne. The district had yielded vast numbers of Paleolithic relics, as we shall see, but at a lower depth (30 feet below the stratum previously worked) in a grotto that had been cut off by recent buildings, the bones of a youth were discovered, with early Paleolithic implements. Such finds are now very carefully controlled, and the skeleton was at once shown to be early Paleolithic. Dr. Reinhardt estimated that it was some 400,000 years at least since, in the penultimate interglacial period, this young specimen of early humanity had met his premature death.* Professor Klaatsch regarded the remains as the most primitive yet discovered—earlier

**Naturwiss. Wochenschrift*, May 20th, 1909.

than the Neanderthal and Spy remains—and this was generally accepted. The familiar early Paleolithic characters—heavy frontal ridges, retreating forehead, bulging teeth, and retreating chin—were very strongly developed.

In the following year (1907), however, another human relic was found which disputes the priority of the Vézère man. This was a lower human jaw discovered at Mauer, near Heidelberg, in October, at a depth of 80 feet below the actual surface. Dr. Otto Schoetensach,* to whom the examination of the jaw was entrusted, claims that it is by far the oldest yet known, and many authorities agree with him. The bones I have already described belong probably to the middle of the Pleistocene period. The Heidelberg jaw belongs to the earliest part of the Pleistocene, if not (as some think) to the last part of the Pliocene. This conclusion is reached on a geological examination of the deposit in which it was found, and it is quite borne out by the appearance of the relic itself. While the teeth, which are preserved in it, stamp it as distinctly human, the massiveness of the jaw and complete absence of chin bring it closer to the ape-type than any other. It is midway in profile between the jaw of the gorilla and that of an Australian native, and much more primitive than the Spy and Krapina jaws. There is very strong reason to regard this jaw as intermediate in type, between the Ape-man of Java and the Neanderthal man, if not entirely on a level with the former. Mean-

**Der Unterkiefer des Homo Heidelbergensis*, 1908.

time we may confidently class it as very early Paleolithic at least.

The most recent find of importance was made by the Abbés J. and A. Bouysonnie at Chapelle-aux-Saints, in the Corrèze, in 1908. It was the skeleton of a man who had stood about 5 feet 2 inches in height, lying on its back, the head supported by stones, at a great depth in a cave. The skull was extremely thick, and had the Neanderthal features (eye-ridges, low forehead, absence of chin) very strongly developed. The distinguished French authority, M. Boule, claims that it is the earliest Paleolithic skeleton yet discovered, and nearer to the Ape-man than any of the others.

Into the dispute as to the chronological priority of these recent finds it is impossible to enter here, but we may pause for a moment to sum up these very valuable discoveries of early human remains. As the matter now stands, we have undisputed remains of a dozen of the earliest representatives of the distinctly human family. Midway, or little less than midway, between the highest ape and the lowest living human, we have the remains found at Java, at Mauer, at Vézère, and at Chapelle-aux-Saints. Coming close after these we have the remains found at Neanderthal, Spy (two skeletons), Krapina (several skeletons), La Naulette, Arcy, and Malarnaud. These chance discoveries show us that a type of humanity much lower than any we know to-day was spread over a large part of the earth's surface in the earlier part of the Pleistocene period. That the later type is evolved from the earlier, or that either type was ancestral to any

modern race, cannot be affirmed with confidence. The whole of the remains *may* belong to races, or off-shoots of the developing human family, which were later extinguished. In any case they give us a most valuable illustration of a phase (or phases) through which humanity passed in its slow upward evolution.

The Java remains record a stage in which the pithecoïd features are so gradually approaching the human that the authorities hesitate whether to pronounce them simian or human, and rightly decide to speak of them as belonging to an Ape-man. It is the next known stage after the large man-like apes of the Miocene, a stage probably belonging to the late Pliocene. The next stage is seen in the Mauer, Vézère, and Châpelle-aux-Saints remains. Here the pithecoïd features have definitely shaded into the human, but the beetling ridges over the eyes, the low forehead, the chinless jaw, and protruding teeth, still recall the gorilla or the chimpanzee.* In the Neanderthal-Spy race these characters continue to be modified, and we approach the type of the living Australian native.

But we cannot fully understand the relationship of these early types until we have glanced at the classification of Paleolithic implements. The discovery of the actual remains of early man has a far greater interest than the examination of chipped flints, but the

*It is not, of course, suggested that the anthropoid ape is in the line of man's ancestry. The stock which was to become human probably diverged very early from the main simian body. It would, however, have to pass through an anthropoid stage.

scantiness of the former still forces us to rely on the very abundant supply of the latter for the more definite arrangement of our material.

Here again, however, we must as yet beware of taking up too dogmatic a position. We have searched only a small part of the earth's surface for the relics of early man, and, great as is the mass of material collected, we must leave room for discoveries that may modify our schemes. In a general way we may say that the stone implements—generally flint implements, but often of other hard stone, such as quartz, chert, greenstone, etc.—of the Paleolithic age begin with roughly worked stones, to be held in the hand, and pass on to edged scrapers, flint knives, and ultimately chisels, borers, and lance-heads. Some claim that scrapers and a rough type of knife are found from the first.

In England it has been customary to distinguish the earlier Paleolithic relics as belonging to "river-drift" man, and the later as of "cave" man. The same distinction was broadly maintained in Germany, and we shall see that it has a general justification. Others distinguish the cave-bear, mammoth, and reindeer periods, but distinction on grounds of animal population is precarious. More recently a French scheme of classification, due originally to M. Mortillet, has been generally adopted in its main lines. On this scheme the various stages of the Paleolithic, which follow upon the (disputed) Eolithic, are known as (beginning with the older) the Chellean, Acheulean, Mousterian, Solutrean, and Magdalenian. Most authorities, how-

ever, omit the Acheulcan, and some substitute the "Papalian" (or "Hippic" = horse-period) and "Cervidian" (reindeer-period) for the Solutrean and Magdalenian.

The earliest or Chelles-Acheulean stage, which takes its name from the French districts (Chelles and St. Acheul) where its implements were found in greatest abundance, is chiefly characterised by what English writers used to call a "celt," and the French more expressively term a *coup de poing*. This is a flint varying from two or three to (especially later) eight or ten inches in length. The unworked back of the thick stone was apparently grasped in the hand, and the front part was chipped to an edge, generally tapering to a point at the top. This tool or weapon (or both) is one of the most characteristic and persistent of Paleolithic types. We recognise the workmanship, even in the earlier and rougher specimens, by the obvious design of the chipping along the edge, and also by the peculiar hollow ("bulb of percussion") made where a piece has been intentionally chipped off by the hand of man. In the course of the Paleolithic period the chipping becomes finer and the tool more effective, though it still seems to have been held in the hand.* We cannot, however, venture to tell the age of an implement from the roughness of the workmanship alone, as lower groups of men continued to co-exist with the more advanced. We have implements of the early Paleolithic

* A claim has been made for the discovery of a hafted Paleolithic implement at Ipswich in recent years. Apart from this disputable claim we have no trace of hafting in the Paleolithic.

that some tribes do not equal to-day. To assign a very early age to a rough Paleolith, we must know that it was found in early deposits (and had not slipped subsequently into them). We have some test, too, in the incrustations on many very early implements, and the deep ochreous colour of their surfaces. The expert alone can apply these tests with confidence.

Recent authorities (such as Dr. Obermaler, who has devoted a special study to the point) believe that other types of implements are found in the older strata together with the "knuckle-duster." I have myself found a worked flint in the gravel of the Lea valley which seemed from position and colour to belong to the older Paleolithic. It was clearly a hammer-stone, or a "celt" that had been used extensively as a hammer, and implied the use of a punch for chipping implements. The remarkable collection of early Paleoliths made by my friend Mr. St. John Parker at Ware includes a great diversity of types. Nevertheless, the *coup de poing* is the dominant type of Paleolithic implement, and is found over the four continents (in Algeria, Egypt, India, and—it is claimed—South Africa and South America, as well as England, France, Belgium, Germany, Austria, Italy and Spain). The gravel-quarry of St. Acheul alone has yielded some 20,000 specimens—a significant indication of the length of the period, since we must assume a sparse population for France in those remote ages.

The other chief types of implements are generally regarded as later inventions, as the primitive life of Paleolithic man developed. The scraper, a thinner stone chipped at one edge (or all round) seems to have

been used chiefly to remove the fat, etc., from animal skins in order to make garments. We shall see that there are grounds for thinking that man was usually nude until the later part of the Paleolithic, but in colder regions he may have come earlier to the invention of clothing. Most authorities do not admit the scraper in the earlier deposits. Mr. Worthington Smith (*Man the Primeval Savage*), who has explored the Paleolithic floor of England at Caddington (near Dunstable) and in certain parts of London, as well as discovered much earlier and simpler implements, only found the scraper at the later level. Mortillet makes the same claim for France. In the present state of the science it may be said that the earliest race we have studied chiefly used the *coup de poing* and indeterminate implements, while the Neanderthal (or later) race introduced the scraper, borer, and knife (a long flake of flint, struck off the core at one blow). The javelin and lance-heads come later still, and the arrow is not found certainly until the Neolithic, or the transition period.*

From this accumulation of evidence we can restore at least the general outline of the story of early Paleolithic man. The question of his relation to the great Ice Age is still unsettled, but the majority of the authorities now think that he wandered into Europe during an inter-glacial period—the period of temperate climate between two extensions of the vast northern ice-sheet.

* The first trace of the arrow is a drawing on the wall of the Grotte des Forges, discovered in 1908. It represents a bison with an arrow sticking in it. These drawings belong to the very last phase of the Paleolithic.

Geologists now agree that, at some undeterminable but very remote date, the climate of Northern Europe fell so low that the snow condensed into glaciers on the mountains, and the glaciers blended on the plains into a vast sheet of ice, which spread over half of Europe and North America. Whether this was due to astronomical causes, or to the uplifting of the land, or to the reduction of the carbon dioxide in the atmosphere, or to changes in the ocean currents, or to a canopy of cosmic dust, is still disputed. Nor are we any nearer agreement as to the time when the glacial period set in. Estimates vary from 800,000 to 100,000 years ago. Certain it is only that the sub-tropical climate of Britain and France in the Miocene (even in Greenland the temperature must have been 30 degrees higher than it is to-day) slowly cooled during the Pliocene, and became Arctic in the early Pleistocene.

German and English glacial geologists generally agree that the ice-sheet proceeded from, and receded toward, the north (or the summits of higher European mountains) several distinct times, with intervening periods of temperate climate. The evidence we have as yet points to one of these interglacial periods as the epoch when the Neanderthal race reached the west of Europe. Whether it was evolved in Europe, or came from Asia or Africa, is too thorny a problem for us to discuss here. At that time Africa was directly connected with Europe across the Mediterranean, and Great Britain was part of the continent of Europe. On foot—no boats are known until a much later period—the squat, powerful, low-browed humans wandered over the available

continent, as far west as Cornwall. Recent discoveries in Scotland are said to show that they even penetrated so far north.

The geological indications point to a genial climate, with broad marshy rivers, and an animal population totally different from that of to-day. The German Ocean and English Channel of to-day were then broad valleys, and great rivers took out their rainfall to points far away from the actual shores. The Thames then meandered lazily over a broad swampy bed, several miles wide; the valley on which London is built has been hollowed out by the river since man chipped his rough tools in its upper gravel-beds. The hippopotamus then floated in our streams, and extinct types of rhinoceroses and elephants and tigers roamed over the land. The Irish elk, the hyena, the bear, and bison, and other creatures, have left their bones in the soil which Paleolithic man trod.

In that genial climate man would not unnaturally live on the gravel-beds by the broad rivers, where stone abounded for his weapons and fish could be obtained, so that "river-drift man" is not an inappropriate name. He would dispute the warmer caves and rock-shelters with the hyena and huge cave-bear only when a fresh advancing ice-sheet lowered the climate; or not habitually until then. We shall find, too, that when art develops tens of thousands of years later, though still within the Paleolithic period, the primitive artist always draws his fellows nude, with marks indicating a pronounced coat of hair. This, with the analogy of the lowest tribes we find in a genial climate, and the apparent

absence of scrapers, seems to indicate that he wore no clothing in that early time.

Whether he lived in isolated family groups or in social aggregations cannot be decided on the direct evidence. Many writers hastily assume that social life had already begun, because we find what we may call the floor of Paleolithic workshops for the manufacture of implements—areas strewn with debris, flint cores, or broken implements. There is, however, no evidence that these belong to the earliest Paleolithic. The “workshops” discovered by Mr. Worthington Smith, for instance, are later than the crude, deeply-stained flints which he assigns to an earlier period. The indisputably earliest stones are always scattered, and many writers assume that men wandered merely in family groups until near the end of the Paleolithic period. That the family group itself was already formed we have very strong reason to believe. It is found among the higher apes, which live generally in isolated family groups, and among the lowest races (Veddahs, Tasmanians, Yahgans, etc.), who also have little social life and no tribal organisation.

The point can hardly be settled on direct evidence, but a very curious light is thrown on it by an examination of early Paleolithic remains. Articulate speech has greatly developed the chief muscle under the human tongue, and caused a proportionate extension of the bony tubercle in the lower jaw to which this hypoglossal muscle is attached. In the highest apes this tubercle is little developed: in civilised man it is very prominent. In the early Paleolithic jaws, several

of which I have examined, this bony prominence is so very feebly developed that Dr. Munro and other authorities conclude that early Paleolithic man had no articulate speech. Speech was so crude, and had to be so liberally supported with gesture, among the Tasmanians that one must not press this conclusion too strongly. It is, however, in accord with the few indications we have that men did not yet live in social groups.

Of the use of fire, again, there is no evidence in the earliest Paleolithic period. On the recognised "Paleolithic floor" of Britain and France we sometimes find charred remains and primitive "fire-places," but, as I have explained, this floor does not represent the earliest inhabitants. The question must be left open. The Tasmanians could not produce fire, nor would primitive man be in much need of it as long as the climate remained warm.

Whether this early race of men buried their dead or not—we certainly do not find any other trace of religious belief—is another of the points which must be left unsettled. The remains which had been discovered until the last few years seemed to indicate death and entombment from accident, but some of the more recent discoveries are said to point to burial. The claim is somewhat precarious. The Vézère skeleton seemed rather to suggest death during sleep, and the Chapelle-aux-Saints skeleton may quite accidentally have a heap of stones under the head. In both cases, however, it is claimed that the remains of funeral feasts are found, and the point needs further elucidation.

In a work of this character it would be improper to attempt any further suggestion of the habits of early Paleolithic man. Those who are acquainted with the conditions of the preservation of animal remains will see that what has already been accomplished by prehistoric science is very considerable. Even the hardest bones will dissolve into their elements in so vast a period of time, unless they happen to be laid in quite exceptional circumstances. This lucky accident occurred in so many cases that already, though the search has explored only a minute fraction of the surface of Europe, we have the full skeleton of early Paleolithic man, and a dozen different relics to show that we possess the normal type. From the bony frame modern science can with much confidence restore the living form, and we have seen what kind of man it was who dropped his flint implements over the wide area between Cornwall and India, if not on to China and Japan, and between Central Germany and Algeria. We have now to see the evolution of this stunted race during the long course of the Old Stone Age.

CHAPTER IV

PROGRESS DURING THE OLD STONE AGE

NOTHING, perhaps, impresses us more strongly with the lowly character of the men of the Old Stone Age than the extraordinary slowness of their advance during that enormous period. We have made immeasurably more progress in one hundred years—in the century of science—than primitive man made in a hundred thousand years. There is not even the most questionable trace of the hafting or polishing of weapons, the use of the bow and arrow, or the making of clothing, until the very close of the Paleolithic period; and there is no trace of pottery, agriculture, weaving, or hut-building, until the Neolithic. The whole advance made until near the close of the period is measured by a slow improvement in the chipping and fashioning of the stone implements.

Though we cannot say with any confidence what period of time is represented by the Old Stone Age, there is a general agreement that it was two or three times as long as the New Stone Age. When we find rich masses of Chellean implements 40 feet below the actual surface of France (at Chelles), and human remains 80 feet below the present surface of Germany (at Mauer): when we reflect that the valley of the Thames, some four miles in width, has been excavated

by the river since primitive man first wandered along its banks, and the German Ocean and English Channel have since then severed England from the Continent: we feel that the period must be expressed in hundreds of thousands, rather than tens of thousands, of years. The most ingenious efforts have been made to give an approximate figure of the duration of the period, but they rest on astronomical or geological theories which have not won general acceptance.

The lowest estimate (Walcott) for the Quaternary period is 270,000 years, and we saw that the most primitive human remains go back to the early Pleistocene, if not the Pliocene. It is, in fact, now generally agreed, even by authorities who reject the Eoliths, that man must have appeared in the Tertiary. If then we take Mortillet's 250,000 years as the minimum for the span of human existence, we find that 240,000 years of this preceded the first dawn of civilisation, and probably 200,000 belong to the Old Stone Age. Many authorities (Dr. Keane, Sir W. Turner, etc.) would multiply these figures by three. In any case, the far greater part of human existence was passed in the dark night of the Old Stone Age.

It would be useless and precarious to attempt to arrange the remaining Paleolithic skulls and skeletons which we have in any series of successive Paleolithic races. That is a task of the future, when the material has greatly multiplied. For the present we can merely say that we have a number of human relics which are later than the Neanderthal race, yet earlier than the Neolithic, and that they show just such an advance in

human features as theory demands, and the stone and other implements illustrate. It is, however, advisable to explain briefly the divisions of the later Paleolithic before we attempt to classify its human remains. The distinction is based partly on climate, partly on animal population, and partly on human culture.

The Chellean period, in which the earlier Paleolithic race lived, was one of fairly warm and uniform temperature. Animals belonging to a genial climate—the cave-bear, hippopotamus, hyena, and southern elephant—flourished in it, and have left abundant remains. Plants such as the wild fig and canary-laurel were then found in Central France. In the Acheulean period the fauna and flora indicate a lowering of climate; but we have followed the prevailing practice of bracketing the Chellean and Acheulean.

In the following period, the Mousterian, the climate sinks still lower, the atmosphere is charged with moisture, and the glaciers begin to spread their icy sheets over the plains once more. This—on the most received calculation—third ice-sheet had a much more restricted area than the previous (and most extended) sheet, and did not prevent the spread of humanity over Southern and Central Europe. The older type of elephant is now displaced by the woolly elephant, or mammoth: the hippopotamus and other warm-loving species retreat south: the woolly rhinoceros replaces the older type. At the same time the worked flints show a marked improvement, and a greater variety of definite types. The chipping of the stones is finer, and the form of the implements more graceful.

In the following, or Solutrean, period the climate is again moderated, apparently owing to the retreat of the glaciers. Finely chipped laurel-leaf shaped, or more pointed and slender implements abound, and scrapers, borers, and other specialised implements are found. The flint seems now to be flaked by pressure, not merely shaped by chipping.

A period of intense cold follows, in which herds of reindeer browse on mossy plains as far south as the Pyrenees, and many animals, which are now confined to the Alps or the colder zone, spread over the plains of Europe. This is the important Magdalenian (or "reindeer") period, in which the Paleolithic age reaches its culmination. Lance and javelin heads of finely worked flint are added to the previous type, and harpoons, needles, and borers of bone are found in some abundance. Men now live in large social groups in the caverns, make clothing of the skins of animals, and develop a considerable degree of skill in drawing on stone, ivory, or reindeer-horn. The Paleolithic race (or races) is making a rapid stride in its last days, but some great change now supervenes, and the stage is cleared for Neolithic man.

This threefold division of the later Paleolithic is by no means universally recognised. Some writers (like Dr. Hoernes) unite the Mousterian with the Chellean: some (Deniker, Keane, etc.) omit the Solutrean: some (Salmon) regard the Magdalenian as Mesolithic: others (Boule, etc.) unite the three in one as "late Paleolithic." It will, perhaps, be most helpful to divide the whole Paleolithic into three broad stages:—

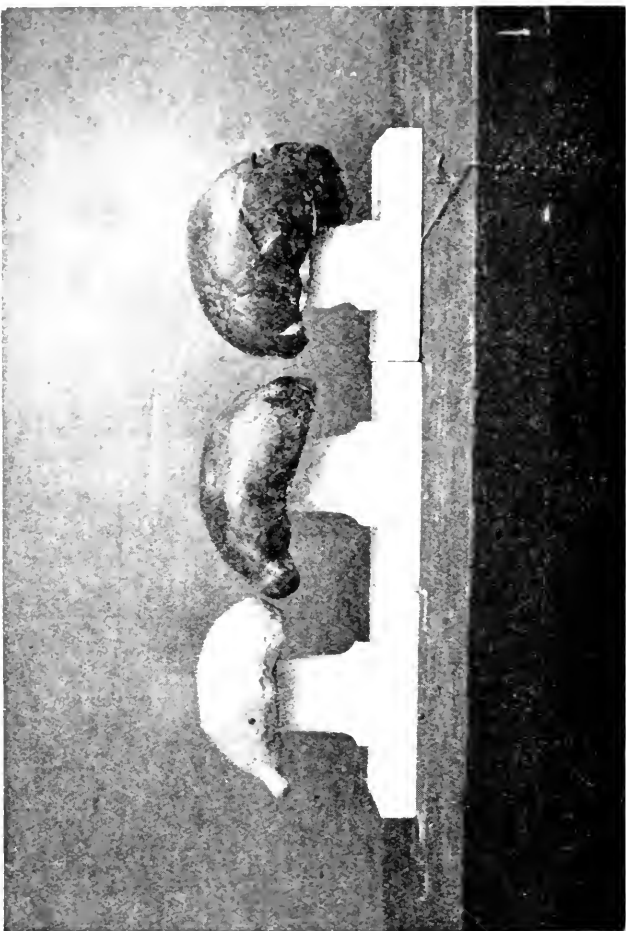
Chellean = River-drift period	}	Cave period
Mousterian (or Solutrean) = Mammoth period		
Magdalenian = Reindeer period		

In regard to the human remains of the later Paleolithic, however, we are quite unable to trace this sequence of stages. They must remain, for the present, stages of culture, climate, and geological deposit. The Neanderthal race we have studied belongs to the Chellean and, perhaps, the earlier part of the Mousterian. The rest of the Paleolithic remains are either definitely Magdalenian, or are not susceptible of chronological arrangement.

To this later Paleolithic group belong the English remains which I have already mentioned: the partial skeleton found in the Tilbury excavations in 1884, at a depth of 32 feet, the fragment of a human skull found in the same year near Bury St. Edmunds (at a depth of $7\frac{1}{2}$ feet, with mammoth remains and Acheulean implements), and the skull and bones found at Galley Hill (Kent) in 1888. Some of the leading English writers have always disputed the Paleolithic character of these remains, but special authorities, such as Klaatsch and Schwalbe, admit it, and they are now generally followed. The Gibraltar skull (1886) is in the same position. Schwalbe, perhaps the chief expert on such matters, declares it to be Paleolithic.

We then have a large group of remains found in various parts of the continent during the nineteenth century. All these are open to dispute, but are now generally classed as late Paleolithic. Naturally, as we approach the end of the Paleolithic, the type shades





SERIES OF PREHISTORIC SKULLS (Java, Neanderthal, English).

Photographed by the Author at the Natural History Museum, South Kensington.

gradually into the Neolithic, and, if the geological indications are uncertain, we must hesitate in our classification. There is not the gulf between the two Stone Ages which the earlier investigators imagined. Late Paleolithic remains cannot very confidently be marked off from Mesolithic or early Neolithic. Moreover, Neolithic man begins to bury his dead, and this means the intrusion of later bodies into Paleolithic deposits.

With this reserve the following list may be drawn up of remains that are generally, but not universally, described as late Paleolithic: the famous Engis skull (1833), which some regard as a relic of a Neolithic grave: certain human fragments found at Denise, in a volcanic deposit, in 1844: the fragments of a skull found at Eguisheim (Alsace) in 1865, in a Paleolithic bed: a skeleton found at Clichy in 1868, which is assigned to a Neolithic grave by some: a skull found at Podbaba (near Prague) in 1883, suspiciously near a cemetery of the Metal Age: a skull found at Brûx (also Bohemia) in 1872: a skull found at Brünn (Moravia) in 1891, which a few regard still as Neolithic: and various fragments from Olmo, Schipka, and Predmost.

On the other hand, we have certain remains which have survived the earlier criticism, and are now generally admitted to be late Paleolithic. A skeleton of this character was found at Laugerie Basse in 1872. From its appearance the conclusion was very strongly suggested that the man had been accidentally buried by a fall of rock. The body lay in a Magdalenian deposit, and the district abounds in relics of Magdalenian industry. In a similar deposit at Sordes, in the floor of

a cave, a skeleton was found in the following year which presented the same appearance of death and entombment from a fall of rock. In 1888 a Magdalenian bed at Chancelade yielded a third skeleton of the same general type. In this case the skull was abnormally large, but many of the other bones pointed to an abnormal or pathological character. These three skeletons are the surest relics we have of the men of the later Old Stone Age.

To conclude with the various remains which are claimed by one or more weighty writers to be late Paleolithic, I may mention a few of the more important instances. The Furfooz skull is still claimed occasionally, but it is, says Dr. Munro, rejected as Neolithic by the most competent authorities. The Cro-Magnon skeleton is still more frequently described as Paleolithic, but is ascribed by most of the leading authorities to a late Neolithic grave; as are also the skeletons found at Grenelle. Some skeletons found in the grottoes near Mentone in 1892 are referred by Boule, Verneau, Dr. Hoernes, Professor Sergi and others, to the late Paleolithic, but are not admitted by other authorities. Other finds at Solutré, Bruniquel, and other parts of Central France are referred by leading French authorities to Neolithic graves. Finally, a skeleton was discovered in Gough's Cavern (near Cheddar) in 1904, which was declared to be Magdalenian in character and deposit, but the claim has not been widely admitted.

We have, then, so few undisputed remains of later Paleolithic man that we must refrain from building on them, as we were able to do in the case of the

Neanderthal race. The admitted remains show a development of the human form on such lines as we should anticipate. The heavy frontal ridges over the eyes are decreasing, the low retreating forehead rises a little, the cranial capacity approaches nearer to the modern standard, though it is still low.* The chin is more pronounced, and the teeth draw inward. The femur is less curved and massive. We shall not be far astray if we put it that, during the long course of the Old Stone Age, man rises from the level of the Tasmanian or the ape-like Central African to the level of the Eskimo. Indeed the parallel will be singularly confirmed by the further details we shall see in regard to the last phase of the Old Stone Age.

From all the indications I have given we can form only a very dim picture of the development of humanity during the Old Stone Age. The descendants of the Neanderthal race, or some other offshoot of the human stem, are still scattered over Central and Southern Europe, and during tens of thousands of years we note only a very slow and slight improvement in the chipping of their hand-weapons and implements. The climate sinks lower and lower. The mammoth and the reindeer now characterise the landscape. The floors of caverns

*Sir E. Ray Lankester makes the singular statement in his *Kingdom of Man* (p. 22) that the human brain is of full weight or size from the start, and that progress consists rather in refinement of structure. This is quite contrary to the facts. The Java man has a cranial capacity of less than 1,000 cubic centimetres, the Neanderthal man of 1,250, and the modern European 1,600 (on the average). The late Paleolithic skulls come between the two, and much nearer to the Neanderthal.

and rock shelters become thickly strewn with relics of man's presence, and we may fitly speak of the cave man, as opposed to the earlier river-drift man.

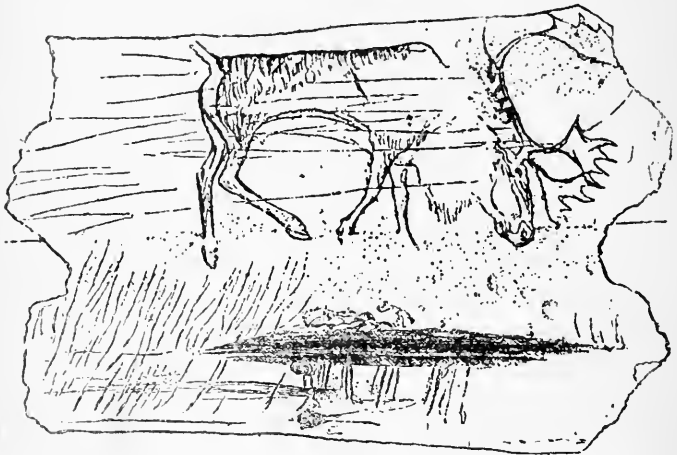
In the last phase of the Old Stone Age we find a more rapid development. There are caves in England (Kent's Cavern, for instance) and France where we can to-day cut through the thick floor-stratum, and discover the various stages of the advance of culture in superimposed layers. Generations or races of primitive men, separated from each other by vast periods, have successively found shelter in the caves, and left the debris of their possessions and food in the soil. We are able to restore the sequence of Paleolithic life in a way which very largely compensates for the fewness or obscurity of the human remains. I have already described how the chief stone implements improve in make, and how stone scrapers, points, borers, saws, chisels, punches (or "fabricators"), and hammer-stones, anvils, knives, and lance-heads make their appearance. Primitive man is now aware that flint can be more finely worked by adroit pressure, or by using a fabricator and hammer-stone, than by merely chipping one flint with another. In the Solutrean period bone instruments begin to appear. Fractured bones are found much earlier, but these longitudinal splits of horse and other bones may merely indicate Paleolithic man's taste for marrow. In the Magdalenian period, however, borers, needles, spear and harpoon-heads (often ingeniously barbed) of bone or of reindeer horn are found in great abundance.

One of the most interesting finds among the debris of the Magdalenian floors is a proof that late Paleolithic

man developed a considerable artistic faculty. Only one of these primitive works of art—a crude drawing of a horse's head—has been found in England (in a Derbyshire cave), but in the caves and rock shelters of Southern France Paleolithic drawings and sculptures are found in large numbers. The drawings are made on bone, ivory, or stone with a pointed flint or chisel: the carvings may be in stone, ivory, or reindeer. They generally represent the animals which are contemporary with Magdalenian man—the reindeer, wild horse, mammoth, bison, etc.—and sometimes the men themselves. The latter drawings are, however, too vague to be very instructive. We recognise a steatopygous type of woman (Bushman type) in some of the statuettes, and this, in conjunction with the claim of negroid skeletons found near Mentone, may give us presently some clue to the movements of population. Other indications furnished by the human figures will be noted presently.

Several attempts have been made to trace the evolution of this primitive art, but the suggested sequence of periods does not inspire much confidence. M. Piette has put forward a theory that man first carved his object entire from a piece of stone or bone, then reproduced it in bas-relief, and finally passed to line-drawing. This suggestion is very strongly opposed to the evolution of the artistic instinct in the child. We can at present do no more than class the objects according to skill, with no reference to chronology. The carvings include some clever ivory statuettes of women, and excellent reproductions of reindeer and mammoth in the ivory or horn handles of daggers. The drawings pass from the crudest

attempts to sketch the head of a horse or goat to such finished works as "the reindeer of Thayngen," a fine representation—considering the material and the stone implement—of a browsing reindeer.



REINDEER FEEDING

From Grotto of Thayngen, near Schaffhausen, Switzerland.

Lest one should be tempted to overestimate Magdalenian man's intelligence from this artistic efflorescence, it is well to note certain curious limitations betrayed by the artist. He has, for instance, no sense of perspective, and cannot group animals. One excellent drawing on stone is still occasionally described as "the fight of reindeer." In reality, it is merely a number of reindeer thrown together on one surface from inability to pre-judge one's space and group them. The Paleolithic artist commonly makes the same blunder as the rustic artist of

to-day, in failing to measure out his space and finishing with an ignominious curtailment of his subject. It is noticeable, too, that, when his animal stands sideways, he always draws the eye in full (like the old Egyptian artist, or the child).

Comparison of these Magdalenian drawings with specimens of Eskimo art has prompted a theory that, either the Magdalenian men came down from the north with the reindeer, or the Eskimo of to-day are the descendants of this old artistic race, retreating north with the reindeer when a warmer climate returned to Europe. Both theories present great difficulties. The former greatly complicates the question of human distribution, and explains nothing. The latter is hardly in accord with the ethnological idea of the Asiatic origin of the Eskimo; nor do we find the least trace of the passage of the Magdalenian race across Europe, slow and gradual as it would have been. The north of France is the limit of the artistic area, which spreads rather over the lower centre and south, into Spain. The art of the Magdalenian period seems to have died out altogether. I may add that the Eskimo drawing which is given in Lord Avebury's work, for the purpose of comparison, shows a complexity of social life far beyond what we can attribute to late Paleolithic man.

It is, on the other hand, quite clear that by the end of the Paleolithic, men lived in large social groups. I have previously mentioned the Paleolithic "workshop-floors" which we unearth in various parts of France and England. These show the manufacture of flint implements to have proceeded on a scale which implies large

co-operative bodies of men. The rough "fire-places" which are often discovered—one was traced on the Paleolithic floor in Cornwall a few years ago—seem to point to the same conclusion. In other places immense heaps of horses' bones seem to represent the kitchen refuse of communities. But the most signal instances have been discovered in the decorated caverns of the Pyrenees and Southern France. In 1901 a cave was opened at Cambarolles, and found to have 109 animal figures, of about life-size, cut into its walls. Some of the outlines were filled in with pigment.* At Altamira a cavern 350 yards long was found, in 1903, to have its walls frescoed with almost life-size drawings of animals. The art is said considerably to surpass anything known among savage tribes.

Such caverns—and many are known—undoubtedly show that men were living in large social groups at the end of the Old Stone Age, but we are unable to say anything whatever on the subject of social organisation. Certain carved bones were formerly described in prehistoric science as "commanders' batons." They are now generally regarded rather as spear or arrow-straighteners. It will be remembered that one drawing represents, apparently, an arrow sticking in a bison. We have no positive evidence whatever on the subject of tribal organisation, and we can only make precarious inferences

*It is claimed that a halter or rope is depicted on one of the horse-figures, and that we must accordingly credit Palcolithic man with the taming of animals. We should hesitate to do this. On some of the human figures there are lines which just as plainly look like tails, but we cannot accept them as such.

from the tribes (Eskimo, Red Indians) which seem to be at about the same level of culture. No doubt, both social organisation and articulate speech would develop speedily after the beginning of communal life. On neither point have we direct evidence.

In regard to clothing and ornamentation we have much instructive material. One of the human drawings of the period, which represents a man chasing an aurochs, gives a series of lines round the body of the man corresponding exactly to the lines which indicate the animal's thick coat of hair. Most of the other human figures give the same indication in some degree. It is impossible to examine these and resist the conclusion that the human body still had a conspicuous coat of hair at the end of the Old Stone Age. This would imply a recent invention, and perhaps scanty use, of clothing. In point of fact, all these human representations depict the body nude.*

Clothing was, however, clearly worn during the reindeer period. Scores of remarkably fine bone needles are found in the soil of the French caves. From the implements we gather that a thin fragment was struck longitudinally off a bone, roughly rounded on a stone with serrate edge, and then smoothed with a stone polisher. The eye was made with a fine flint borer. Some of the surviving specimens are certainly wonderful pieces of work; but when M. Mortillet would assure us

*As certain writers have seriously enlarged on the moral propriety of these drawings, I must warn the reader that the reproductions of them in popular circulation have been decently modified. The originals show no such delicacy.

(*Le Préhistorique*, p. 197) that no equally good needles have been seen since "until the Renaissance," and that "even the Romans had no needles comparable to those of the Magdalenian period," we respectfully demur. For thread the Paleolithic tailor would probably use animal sinews. His material would undoubtedly be animal skins, more particularly of the reindeer. Even ornamented buttons occur among the debris. One drawing represents, apparently, a tattooed arm, and the granite mortars which we find in Magdalenian strata, though often conceived as mortars for preparing food, were probably used to prepare the pigment from marrow. Other stone vessels rather point to use in cooking; others, again, have an appendage which suggests that they served as lamps. There is no trace of pottery, weaving, or agriculture.

That fire was commonly employed before the end of the Old Stone Age we have ample evidence, but when and how Paleolithic man learned the important art of making fire is unknown. Some suggest that the natural firing of material by the sun's rays or by volcanic matter may have given him the hint. Unfortunately, neither would give him the least hint *how* to make fire. From the circumstance that most savage tribes obtain fire by friction others conclude that this must have been the method employed by primitive man. In point of fact, the earliest fire-making implements we have—from Neolithic graves—are flint and iron pyrites, and it seems to me more likely that this was the first means of obtaining fire. Implements were made from any kind of hard stone, and it is not unnatural to imagine that iron ore

was occasionally taken to be a likely material. We shall see later that this was commonly done in Egypt. The sparks struck off in chipping with a flint may very well have led to a deliberate use of iron pyrites.

If our knowledge of middle Paleolithic man is scanty, therefore, we have ample compensation in our knowledge of late Solutrean and Magdalenian man. It is futile to speculate on whether he was a descendant of the Neanderthal-Spy race. Some branch of the human family at that level of culture slowly rises to the culture of the late Paleolithic. We have little serious reason to doubt that it is an evolution of the earlier race we examined in the last chapter. During the tens of thousands of years of the middle Paleolithic, man makes singularly little progress. At last he begins to live in social groups, and his slow wit is more briskly sharpened.

With his fine flint and bone javelins he can pursue the wild horse and the reindeer, if not attack the mammoth. From the hunt he returns to the blazing fire in the communal cavern, and his simple human emotions and needs forge the instrument of articulate speech—the great lever that has lifted him so high above the brute. The mother of his children has fine implements with which to sew the animals' skins into warm clothing, and an artistic caste springs up to decorate his weapons and his walls, and beguile the hours of rest with drawing and sculpture. The marks of his brute origin—the heavy eye-ridges and bulging jaws—slowly disappear. He is unconsciously ascending toward the civilisation of a remote future.

At this point we encounter a curious confusion in our fragmentary record of the onward march of humanity. The men of the Old Stone Age rapidly disappear from the central stage of the earth, or linger only in the backward tribes of Asia, Africa, and America. A new race of men, of higher type, comes on the scene. The New Stone Age begins.

CHAPTER V

THE MEN OF THE NEW STONE AGE.

UNTIL a decade ago writers on prehistoric man were greatly puzzled by what they called the hiatus between the Paleolithic and Neolithic ages. The thread of evolution seemed to be snapped. The men of the Old Stone Age apparently descended into the earth, in Europe, and a new and higher race emerged suddenly from complete obscurity. From the evolutionary point of view it was, of course, certain that this Neolithic race had developed from some branch of the older race in some as yet unexplored region, but the entire absence of transitional forms was tantalising. The new culture seemed to overlies the older without intermediate stages.

This hiatus has now, in the opinion of most authorities, been partially filled, and a Mesolithic period (or Middle Stone Age) is generally recognised. Two details may have attracted the particular notice of the reader in our account of the Magdalenian period. One is the circumstance that the centre of the advancing culture lay in the extreme south of France, and the other the fact that certain human remains and representations pointed to an invasion from North Africa toward the end of the Paleolithic. The inference that an important branch of the late Paleolithic race lay still further south, and that this branch advanced to the Neolithic stage, was obvious

enough. It is probable that the land-bridges still existed between Europe and Africa, and the strip of Africa north of the Sahara has been increasingly favoured by students as the probable breeding-ground of higher races. Civilisation itself was evolved in that latitude, out in Europe. Sergi and others believe that Magdalenian man came from North Africa, while Neanderthal man was—as is commonly believed—developed in Europe.

Most of our English authorities believe that this island—now severed from the Continent—entirely lost its Paleolithic population, and remained without human inhabitants until the Neolithic invaders arrived. Plague, submersion of the land (of which geologists find confident traces), destructive climate, and various other more or less fanciful causes, are suggested for the extinction of Paleolithic man in Britain. I do not see that we are compelled to admit this mysterious depopulation. There is, assuredly, no clear trace of evolutionary transition in England from the Old to the New Stone Age. Mr. Worthington Smith describes some of the implements discovered by him as “mesoliths”; Mr. Brown contends that he has traced the continuous advance from Eolithic to Neolithic at East Dean; and claims of Mesolithic traces are now advanced from Scotland and Ireland. All these are controverted; and, on the other hand, there are localities where the Paleolithic remains are separated by a distinct gap from the Neolithic. Yet the facts—which are still very imperfectly known, it must be remembered—do not seem to be generally inconsistent with the plain theory that the better equipped Neolithic invaders made an end of the cruder Paleolithic. We

should thus get rid of the perplexing supposition that the whole human population was extinguished from natural causes, while the animal population generally continued its normal course.

In any case we are driven further westward and southward for the evidence of continuity, and the leading French authorities are now agreed that such indications are found in the caves of Southern France. The fine bone and stone implements found in the caves of Mas d'Azil, Reilhac, etc., are held to lead onward to the Neolithic age.* Some authorities (such as Boyd Dawkins), while not questioning that the new race was evolved from the old in some part of the earth, deny that the French explorers have filled up the hiatus, and one must grant that there is much force in the objection. If we had a distinct picture of the latest stage of Paleolithic culture and the earliest stage of Neolithic, it is possible that the two would be fairly bridged by the Azilian (Mas d'Azil) culture. We have, unfortunately, no such picture of the earliest phase of the New Stone Age, and cannot distinctly say in what particulars it advanced at once on the culmination of the Magdalenian. Many of the pictures of "Neolithic man" are very misleading. They are correctly based on Neolithic remains, but it is quite impossible to say, and unlikely, that Neolithic man possessed all this culture from the start. The question must remain open.

* In the Mas d'Azil cave were also found certain pebbles, curiously marked with bands and dots of colour. The significance of these is much disputed, and very obscure. It is claimed that some of the marks strikingly resemble the primitive Cypriote and Ægean alphabets.

On the other hand, however, the sudden disappearance of the very promising art of the Magdalenian is a well-known fact which seems to point to a change of race. The older race, habituated to the cold and living largely on the reindeer, may have followed that animal northward as the climate grew warmer once more. The inhabitants of North Africa may then have sent a wave of their race into the tempered north (the south of Europe), and these invaders might blend with part of the race of Southern France.

Here we touch the thorny problem of race, and a word of warning must be given before we proceed. Hardly any question in the whole of the science is farther from settlement than this, although prolonged labour has been spent on it. The fact that two distinct types of skull—the long and narrow, the short and broad, skull—were persistently encountered, seemed to provide a clue to racial origin and blending, and great efforts were made to disentangle the “dolichocephalic” (long-skulled) and “brachycephalic” (short-skulled) races.* It cannot be said that the craniologists have been successful. The leading experts offer us the most contradictory versions of the origin of Neolithic man, who is brought from nearly every point of the compass. Indeed, refinements of skull-structure have induced some

*In such measurements the proportion of width to length of the skull is the basis of classification. The length of the skull is taken as 100. If the breadth is in the proportion of 70-75 to this (it is rarely less than 70), the skull is dolichocephalic: if the proportion is 80-85, the skull is brachycephalic: the intermediate skulls are now known as mesaticcephalic.

experts recently to split up even Paleolithic man into several species, to say nothing of races or varieties. Other authorities are now contending that the form of the skull and other physical characters are not to be relied on at all, as such features seem rather to be changing effects of environment, not persistent hereditary types. These writers are disposed to fall back on the old test of language.*

In view of this obscurity and of the very restricted range of the present work we must take the question of the Neolithic race on broad lines, as we have treated its predecessors. We saw that certain remains found at Laugerie Basse, Chancelade, and Sorde give us a fairly confident idea of late Paleolithic man, who was probably on an intellectual level with the Eskimo or the Amerind. Then we found a large group of human remains which are attributed by some to the late Paleolithic and others to the early Neolithic. One is tempted to see in the very divergence of opinion a proof of the continuity of the race in Europe. Schwalbe, for instance, one of the first authorities on skeletal characters, insists that the Gibraltar skull is early Paleolithic, and the Brûx, Galley Hill, and Brûnn remains late Paleolithic or transitional. Others contend that they are Neolithic. We may at least conclude that the human remains show more continuity than the stone implements and artistic survivals, and do not betray any pronounced hiatus.

* See, especially, the presidential address of Professor Ridgeway to the Anthropological Section of the British Association in 1908, published in *Nature*, Sept. 24th, 1908.

Only one further group of remains need be added to those already described. Very important finds of prehistoric skeletons have been made in certain grottoes on the Franco-Italian frontier, near Mentone. A skeleton had been removed from there to Paris in the early days of the science, and in 1892 a workman brought three more skeletons to light. Most of the authorities regarded them as Neolithic skeletons buried in a Mousterian bed, but there was much controversy. This led to a diligent search in all the grottoes of the district, and about twenty skeletons in all were discovered.

The oldest and deepest skeletons, found at a depth of 25 feet in the Grimaldi cavern, were of a peculiar character, and said to have negroid features.* Their flat noses, bulging jaws, and small stature prompted this conclusion. Although the smallness of stature may be explained on the ground that they were (admittedly) the frames of a youth and an old woman, and although it is true that the skulls were much flattened and damaged by pressure, it is difficult to think that the high authorities engaged could have been mistaken. They were clearly much older than the other bodies. Possibly we may see in them proof of a transitory invasion from Africa. The Bushmen are known to have ranged as far as Somaliland in the historical period, and many of the Magdalenian statuettes ascribe Bushmen characters to the women represented.

The rest of the Mentone skeletons are said by Hoernes

* *Les Grottes de Grimaldi*, by MM. Villeneuve, Verneau, and Boule, 1906—the official report on the discoveries.

(*Natur und Urgeschichte des Menschen*, 1908) to be now generally recognised as Quaternary (Paleolithic). They are assigned to the "Cro-Magnon race." In the earlier days of the science the earliest known race was known as the "Cannstadt race," the second as the "Cro-Magnon," and the third as that of Furfooz and Grenelle. This classification is superseded (the Cannstadt skull being of doubtful origin), but the name Cro-Magnon is still commonly given to the race to which most of the disputed remains I have enumerated belonged. The very careful study that was made of the Mentone remains seems to show that the race does belong to the end of the Paleolithic, or the transition to the new period. It was a robust race of good stature and fair intelligence. There are still distinct bony ridges over the eyes, but the forehead is rising considerably, the chin is well developed, and the teeth are less protruding. The type is said to be not unlike that of the modern Berber.

In view, therefore, of the fair continuity of type and the comparative disturbance of culture (the extinction of Magdalenian art and appearance of better-made weapons) it seems reasonable to infer an invasion of Europe by a not dissimilar, but slightly more advanced, race at the beginning of the Neolithic. As our evidence increases, the line between the two periods is increasingly blurred. There is, assuredly, no pottery, no agriculture, no weaving, and no house-building during the Paleolithic. But there is no proof that these, or any of them, came in at once with the Neolithic race. On the other hand, features which were once thought to be exclusively

Neolithic are now generally admitted in the late Paleolithic. The arrow, for instance, is now commonly admitted in the Magdalenian, since one of the drawings seems to represent an arrow, and a reindeer bone, with an arrow in it, is attributed to the Magdalenian. The practice of burying the dead, which may imply some religious belief, is also commonly admitted now—though denied by Mortillet and others—in the Magdalenian. The Mentone skeletons all seem to have been interred.

Where the new race came from into the south of Europe is not easily determined. The slender evidence we have disposes us to look to North Africa. In the Grimaldi skeletons we have indications of a passage from Africa, and we shall see later that Neolithic negroid pygmy skeletons have been found in Switzerland. It may be recalled that civilisation first developed in the region where Asia and Africa meet, in the valley of the Nile and the highlands of Southern Syria. If we may suppose that the inhabitants of this region were the more advancing in culture, even at the earlier date, the various immigrations into Europe may have come, directly or indirectly, from there. They could reach Western Europe either by way of North Africa or by the valley of the Danube. It seems most in accord with the little evidence we have to suppose that the first Neolithic wave came through North Africa, and the second by way of the Danube. In the first case there may have been merely a spread of culture along the strip of North Africa, and then a movement from Algeria to the south of Europe. But the evidence is very slender, and the question must be left open.

Nor are we in a better position to answer the very natural question: At what date, approximately, did Europe witness this appreciable change from Paleolithic culture? There are authorities who would regard 20,000 years as an adequate allowance since the first Neolithic invasion of Europe: others give us the figure of 50,000 years: Dr. Keane speaks of 70,000 years: and Sir William Turner claims to have shown that it is 100,000 years since Neolithic man invaded Scotland from the north of Europe. We must refrain from any attempt to give even the roundest figure.

It would be particularly interesting to pass in review the different stages of the Neolithic age, and watch the slow unfolding of those industries and institutions on which civilisation gradually rises. This, unfortunately, we are unable to do. The remains of the entire period—some tens of thousands of years—shrink into a thin confused layer on the earth's surface, and we cannot, except on very broad lines, distinguish its successive stages. The archæological writer is usually content to give us a picture of "Neolithic man," in which all the details known to the science are embodied. This, though almost inevitable, is misleading. Such a picture is bound to represent as simultaneous many features which may have been separated from each other by the lapse of thousands of years and by vast stretches of space.

The life of Neolithic man is revealed to us from the contents of his graves, and the implements scattered in the soil or in the shell-mounds of Denmark, especially in the mud of certain Swiss lakes, over which Neolithic

communities once lived in villages built on piles. As, moreover, the bulk of our savages maintained the Neolithic culture until recent times, a comparison of the ancient remains with their implements and utensils enables us to form a very ample idea of at least the later phases of the period.

The period takes its name—Neolithic—from the outstanding fact that the stone implements and weapons now greatly improve in manufacture. It is sometimes described as the period of polished stone implements. As a broad characterisation this is very true, but one must understand that the polishing of bone was well known in the Magdalenian period—witness the needles we described—and that by no means all implements were polished in the Neolithic period. Dr. Blackmore suggests a distinction of the three periods in the formula that the Eolithic implements were “hacked,” the Paleolithic “chipped,” and the Neolithic “flaked” (by pressure). This, again, must be taken as a distinction of outstanding, but not exclusive, characters; as, of course, Dr. Blackmore intends. Some Eoliths seem to indicate chipping, some Paleoliths are hacked, and other (later) Paleoliths are apparently flaked. The more our material increases, the less we are disposed to admit sharp lines in the continuous evolution of the Stone Age.

The most characteristic implement of the New Stone Age is the axe or chopper. The elongated “pick” (as it used wrongly to be called) of the later Paleolithic now becomes a definite axe-head, with (in the end) a hole for hafting. In the later Neolithic (especially in Denmark) this is at times so finely finished and polished that in

photographs it looks exactly like metal. Indeed, we shall see that the form runs on directly into the Metal Age. Other hard stones, besides the flint, chert, and quartz of the Paleolithic, are now largely employed. We have finely polished axes, knives, spears, or arrows, in greenstone, diorite, jadeite, obsidian, jasper, chalcedony, felstone, serpentine, etc. Any hard stone that lay on the surface was employed.

We even find that Neolithic man sank shafts into the chalk in search of seams of better flint. A series of holes in Norfolk, locally known as "Grime's graves," turned out to be flint pits dug by Neolithic man. Others were discovered at Cissbury. Even miners' picks of deer-horn (as well as stone axes), and chalk lamp-vases were discovered in the deserted shafts and tunnels. The shafts are from ten to forty feet deep—the finer flint being found at lower levels—and the tunnels, which connected the shafts, sometimes run to thirty feet. The tools are generally of rough Neolithic workmanship, but we cannot on that account conclude that the excavations were early. The roughly chipped implements persisted alongside with the new; just as in many a British blacksmith's shop of the last generation one would find hammers hafted with a twisted ozier, much as Neolithic man probably fitted some of his stone hammer-heads. For ceremonial purposes (Mexico, Egypt, etc.) stone knives continued to be used long after the introduction of metal.

In a few cases the perishable wooden handles of weapons have survived. Arrow-heads are found thrust in a cleft of the shaft, with binding thongs, and axe-heads

are sometimes discovered in a similar cleft in the handle, with a piece of horn inserted between the two. In the finer axes a hole was bored through the stone with great skill and neat finish. Experiment shows that this could be done by grinding through with a twisted stick, working in wet sand.

The numerous other forms of weapons made by Neolithic man we must be content merely to mention. Knives of various shapes and different modes of hafting, spear and arrow-heads of the most beautiful finish (especially in Ireland, Scotland, and Denmark), chisels, adzes, crescent-knives (or "sickles"—Egypt, Japan, etc.), scrapers, fabricators (or flakers), and borers, are found in all parts of the world. In some places we have found the polishers, or large hollowed stones, on which Neolithic man ground his weapons. One must remember that, although the New Stone Age is very much shorter than the Old, the population must have been now considerably greater. Moreover, the use of stone by no means ceases the moment a race becomes acquainted with the use of metal. For nearly 5,000 years after its discovery of bronze Egypt continued to use flint implements for the great majority of industrial purposes. Bronze was introduced into Britain about 1,800 years before the Christian era, yet stone weapons figured in British battles until the Middle Ages. Even when metal was in general use, the priesthoods of various nations still used stone for ceremonial purposes. Where the use of stone was entirely discarded, a superstitious feeling grew up in regard to the old weapons which were discovered. In ancient Egypt and Italy arrow-heads

were mounted as amulets. It is not many years since application was made to the Liverpool Museum for permission to touch an ailing child with one of the stone axe-heads in the collection.

One group of Neolithic implements has always aroused special interest, and has given rise to some fantastic speculation. These are the "pygmy" implements. Not only in many parts of England (Cornwall, Wiltshire, Lancashire, Suffolk, Lincolnshire, etc.) and the Continent, but also in India (especially on the Vindhya Hills), Palestine, Egypt, and North Africa, finely chipped implements of abnormally small size have been found, and to these the unfortunate name of "pygmies" has been given. Ingenious writers at once associated them with a race resembling the undersized men of the Central African forests, and contended that they showed a former distribution of this race over the area from Cornwall to India.

A solid ground for this belief was claimed when, between 1892 and 1896, a Neolithic pygmy colony was explored at Schweitzersbild (Switzerland). In a bed which apparently represents the beginning of the Neolithic were found nine normal skeletons and five pygmies. Dr. Neusch and Professor Kollmann, who investigated the remains, propounded a theory that these pygmies were representatives of the earliest inhabitants of Europe, and that the taller race was evolved from the shorter. This theory has not been widely accepted, nor is it consistent with the early Paleolithic remains we have described. Technically, the pygmy is a member of a race which averages less than four feet eleven inches

in height. There are several such races known, the most extreme type being found in the Central African dwarfs. Early Paleolithic man, however, averages, as we saw, a few inches over five feet, and no very early pygmy remains are known. It is more probable that the pygmies are a degeneration from the early standard. In a region, for instance, where food was scarce, the smaller individuals would have an advantage, and the stature of the race would tend to be lowered by selection. It was probably such agencies that reduced the vast reptile world of former days to its present dwarfed proportions.

A further ingenious conclusion that was drawn from the wide spread of the "pygmy" flints may be noted in passing. Sir Harry Johnston, the great authority on Central Africa, has observed that the behaviour of the pygmies in contact with the taller races is curiously parallel to the conduct of the fairies in our old legends. The supposed spread of pygmies over Europe at one time seemed, therefore, to afford a substantial basis for the legends themselves. If the pygmies persisted through the Neolithic period side by side with the taller races, we might assume that the relation between "the giants and the dwarfs" would be not unlike that described in the legends.

The discovery of four pygmy skeletons is too slender a base for so far-reaching a conclusion. Like the negroid Grimaldi skeletons, they may merely represent a sporadic invasion from Africa. On the other hand, the "pygmy" implements are most fallaciously quoted in support of either of the two theories I have indicated.

The smallest race we know averages about four feet three inches in height (like the Schweitzersbild skeletons), and this is far too much for the miniature implements we have found in various parts of the world. They are quite commonly less than half-an-inch in length; some go down to one-sixteenth of an inch. One collector found scores of "pygmy" scrapers which weighed less than half-an-ounce.* If these are the normal implements of any race, we should have to assume a series of races dwindling in stature down to inconceivable dimensions. It is far more probable that these miniature implements were made for special purposes by a normal race of men. The Rev. H. G. O. Kendall has pointed out (*Man*, 1907, p. 83, and 1908, p. 53) that many might be used as harpoon-barbs, or even hooks, in fishing, and that they are found more abundantly in fishing stations; though the latter point requires general verification. Others may have been used as arrow-tips, for piercing skins or shells (which were much used as ornaments in the Neolithic), for tattooing, or for purposes of which we have no analogy. It is better to describe them as "microliths." There is not the least reason to assume that the specimens we find in different parts of the world had a common origin, or belonged to a common race. Like needs engender like appliances; as we see in the different groups of horned or of flying animals.

Apart from the implements, which are scattered over the surface of a great part of the earth, or found at little

* *Remains of the Prehistoric Age in England*, by Dr. B. Windle, 1904.

distance below it, we have special localities for obtaining knowledge of the men of the New Stone Age. These are the shell-mounds, or "kitchen-middens," of Denmark and other countries; the remains of the pile-dwellings of the Swiss and neighbouring lakes; and the tombs, stone monuments, and rude dwelling or storage places which abound in this and other countries. The last two, the richest and most important source of information, must be reserved for the next chapter. The first may be briefly discussed here.

The inhabitants of Tierra del Fuego, the lowest of whom (the Yahgans) are amongst the most backward we know to-day, live chiefly on shell-fish, and the discarded shells form large mounds along their coasts. When similar mounds, principally of oyster-shells, were found along the coast of Denmark, it was obvious that they were, as the Danes say, the *kjökkenmöddings* (kitchen middens) of a very early and primitive race of inhabitants. Denmark and Scandinavia would be covered by the later and less extensive ice-sheet (or sheets) long after central Europe was habitable, and we do not find that Paleolithic man ever penetrated so far north. When the last ice-sheet had disappeared, a branch of the Neolithic race occupied the liberated country, and settled largely on the Danish coast—washed by the Gulf-stream—where food was easily obtained in abundance. Like the Fuegians, they lived mainly on molluscs, and mounds of shells, often several hundred yards long, indicate their settlements to the modern students.

The stone implements which are occasionally found in these refuse-heaps are of a crude description, but we

must not hastily attribute them to the earliest period of the New Stone Age. The tribes which wander out of contact with the rest of advancing mankind often degenerate—as there is reason to suspect in the case of the Fuegians themselves—and may lose much of the culture of their own ancestors. On the other hand, the calculations which would place the beginning of the shell-mound period at between 3,000 and 5,000 years before the Christian era are unreliable. Neither the rate of accumulation of shells, nor the growth of forests, is a process that can be regarded as identical in remote periods.

It is not without significance that we find no trace of agriculture in the remains of the mollusc-eaters, and that the only trace we find of a domestic animal is the dog. Unless we admit actual degeneration, we have here an interesting early phase of Neolithic life. The presence of simple pottery, and the fact that some of the implements are actually made out of polished weapons, make it clear that they do belong to the New Stone Age. We shall see that in other localities Neolithic man shows an acquaintance with agriculture, weaving, several breeds of cattle, and much concern with the dead. As I said, it would be extremely interesting to be able to follow the gradual development of these inventions and ideas, and the shell-mounds apparently exhibit one of the earlier phases. We have, however, reason to believe that a more advanced race lived at the same time on the mainland of Denmark. The Bronze Age began in Denmark about the same time as in Britain—nearly four thousand years ago—and the bronze-using men, if not a

fresh invasion, could hardly be the descendants of the lowly kitchen-middeners.

In referring to these shell-mounds one is once more reminded of the fallacy of inferring identity of race from similarity of habits in different parts of the world. Somewhat similar shell-heaps, of great antiquity, are found on the shores of Britain—on the Moray Firth and other parts of the Scottish coast, at Ventnor, Hastings, and other parts of the south coast of England, and at Cork Harbour in Ireland. We have no clue to the date or race of these mound-makers. In Japan, again, we have relics of the same character. From the designs on some of the fragments of pottery in these mounds there is a tendency to conclude that the early mollusc-eaters of Japan were the ancestors of the Ainus. The Japanese proper were in the bronze stage when they invaded the islands, and as this invasion is dated some centuries before Christ, the mounds must be much older, at least in the south.

One must bear well in mind always the fact that science, strictly speaking, tells of stone and metal *phases*, rather than *ages*. While the more fortunately situated people were advancing from stage to stage, the more isolated remained unaffected. To speak of Stone Ages and a Metal Age is true in the sense that there was a prolonged period in which no branch of the human family had got beyond the chipping of stone implements, a further long period in which no race had yet discovered the use of metal, and finally, a period in which the more advanced races discovered the art of making implements of copper, bronze, and iron. This is a chronological arrangement

for the main current of human development. But out on the wings of the human army there were always detached regiments, out of touch with the main advancing body, who retained the primitive weapons of the earlier days. The farther these detached fragments wandered, in the search for food and peace, the more surely they forfeited the stimulus to advance and the opportunity to imitate.

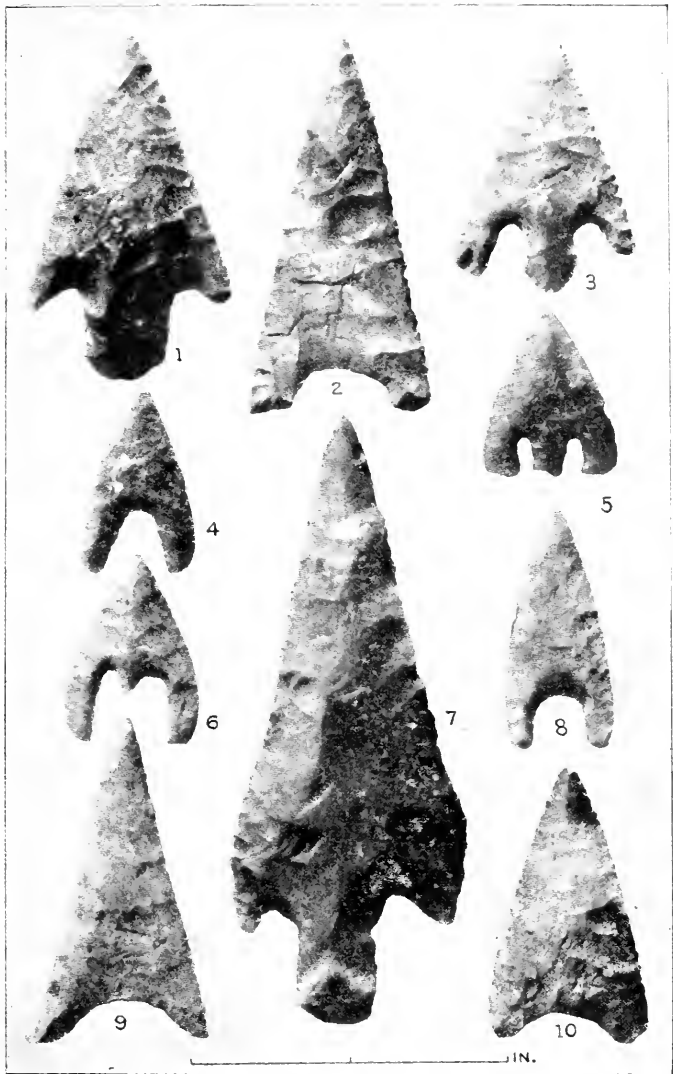
We must not, therefore, attempt to judge the age of a human relic by its lowliness. Far away, on the frontiers of the inhabited earth we find representatives of the earliest human wanderers. The Tasmanians, driven by the oncoming Australians to the tip of their continent, and then cut off by the sea: the Yahgans, pressed to the extreme south of America, and cut off in turn: the Bushmen, driven to the tip of Africa (and turned upward again by Europeans): the natives who sought shelter in the forests of Central Africa, or the islands of the Indian and Pacific Oceans (Ceylon, Malasia, and the Philippines), represent the humanity of the earliest known days. The Australians, Papuans, and other tribes represent a next phase; and so on through the vast hierarchy of races. We must not press the idea too far—on account of later borrowing of one tribe from another—but in a general way we can arrange these backward peoples in a cultural series which roughly represents the cultural development of humanity, and throws a useful light on the past. This new method of inquiry—a combination of ethnography and prehistoric science—can, however, only be indicated in a work of the restricted dimensions of this.

CHAPTER VI

THE MONUMENT BUILDERS

IF the shell-mounds represent an earlier phase of the New Stone Age—even if they be of late occurrence—the pile-villages of Switzerland distinctly represent a later phase. Both they and the graves, which we shall consider presently, exhibit the culmination of the Stone Age, and passage into the Bronze. Both, also, are peculiarly adapted to preserve traces of the remote races to whom they belonged. The Neolithic period is so brief from the geological point of view that its scattered relics are compressed into a thin seam, in which we should have great difficulty in restoring the chronological succession. Fortunately, we have these special centres of accumulation of Neolithic remains, and they enable us at least to attempt the task of reconstruction.

Deferring for a moment the very difficult question of race, we find two marked phases of cultural development. The first is revealed in the shell-mounds and in the more primitive of the scattered implements; and to this stage may be referred many of those human remains which we discussed in connection with the transition to the New Stone Age. We have a race of men, taller and more graceful in build than their predecessors, with the simian features almost obliterated. The advancing brain has



NEOLITHIC ARROW HEADS OF FLINT, FROM IRELAND.
(British Museum.)

raised the dome of the forehead, and the heavy frontal ridges have shrunk in proportion. Improvement in diet has brought the jaws and teeth nearer to the modern standard. This race is still "long-headed," and, whether it be an invading race or no, is not so far removed from the later Paleolithic as to be beyond the range of direct evolution. If we adopt Professor Sergi's idea of a Mediterranean race, living north and south of the inland sea, we may still bring early Neolithic man from Africa without a serious breach of continuity. We return to that point later.

The culture of the early New Stone Man is not so startlingly higher than that of his predecessor as used to be believed. His stone implements show the finer finish which we should expect, in harmony with the evolution of his brain. He uses a bow and arrow habitually; though it is claimed that these were known to late Paleolithic man. He has much personal adornment of shells and perforated teeth: another practice which began in the late Paleolithic. He has tamed the dog (taking the shell-mound phase as early Neolithic), but not yet the ox and the sheep; probably in the south he has already tamed the horse. He has invented a crude pottery, but there is as yet no clear evidence in the early Neolithic of agriculture, weaving, or ceremonial concern for the dead. On the other hand, he has lost the artistic skill of the Magdalenian and Azilian cave-dweller.

The invention of pottery is one of the most distinctive advances of Neolithic man, and it merits brief consideration. Mr. Clodd (*The Story of Primitive Man*) has plausibly suggested that the invention of pottery may be

the accidental result of primitive cooking. It is claimed, we saw, that the charred remains of feasts, and even stone vessels for cooking, are discovered in the Paleolithic. It is generally believed that late Paleolithic man cooked his horse or reindeer joint. If we imagine him daubing a wicker or rush vessel with clay, to prevent the charring of the meat, we see that he would in the end find himself in possession of crude earthenware vessels. The clay would harden and retain its form. It is held that the curious marks (as if made with the finger-nail) which we find on the earliest pottery, are a crude imitation of the marks that would be made on the clay by the assumed framework of wicker or rushes in the primitive cooking.

Clay is so plastic a material that, if the artistic race had persisted, we might very well expect it to do much finer work than it had been able to do in stone or ivory. We find, however, no advantage whatever taken of the new material. Not only does the old artistic industry die out, but the new ornamentation is of a remarkably inferior character. The graceful lines of animal forms are replaced by monotonous circles and spirals which betray the death of the old inspiration. In one case only have we found a few crude clay statuettes. Generally, the marking on the early pottery, on which the Magdalenian artist could have worked so skilfully, is so crude and meaningless that the earlier artistic models seem to be wholly forgotten. Artistically, man sinks back to a low savage level. As he undoubtedly had advanced considerably in intelligence, this points strongly to a large movement and displacement of

population. Such movement would also enable us to understand the intellectual advance itself.

From the crushed and scattered relics of the New Stone Age we are unable to retrace the steps by which Neolithic man advances toward the threshold of civilisation. When we reach our next firm ground, we find him very materially advanced, though by no means farther advanced than the lapse of time and his relatively high intelligence enable us to understand.

In 1853 there was an exceptionally dry season in Switzerland, and the receding waters of the lake at Zürich exposed a number of ancient piles on the lake-bottom. Further search was made, and, in that and the following year, further groups of piles were discovered in the margins of the Alpine lakes. Savage life supplied a clue once more to the interpretation of antiquity. It may be, indeed, that some Swiss student recollected how later Romans had taken refuge on the islands in the lakes from the descending barbarians. In any case, the villages which are built to-day over the water on piles in New Guinea and Malasia—numbers may be seen at Singapore—suggested that similar pile-villages had been built over the waters of the Swiss lakes several millennia before the Christian era. The finding of prehistoric implements among the mud put this beyond question.

Subsequent inquiry extended both the analogy and the number of settlements. The "crannoges" of Ireland (and a few in Scotland) were similar refuges from the mainland—in this case artificial islands, approached by gangways of stone or wood, which could

easily be cut off, or in boats. Traces of similar settlements have been discovered in Japan, Austria, France, and England. The most extensive centre of pile-villages, however, is the Alpine district. In the lakes of Switzerland and those parts of France, Italy, Germany, and Austria which surround the mass of the Alps, nearly 300 such settlements have been detected. They range from small clusters of hut-piles to large villages 230 yards long and 55 yards deep. In the Bronze Age they became even larger. The settlement at Robenhausen is calculated to have been supported by about 100,000 piles (12 feet in length and 18 inches in circumference) of cedar, oak, and beech wood. Cross-beams are believed to have provided the platform on which the floor of the hut was laid.

The comparison with the pile-dwellings of the Indian Ocean must not be understood to mean that there is any parallel in the culture of the races. The Swiss Neolithic men were far higher than the Papuans or the lower Malays. The situation of their huts—chosen, no doubt, for defence against a race on the land—was excellent for transmitting the details of their household to remote ages. Whenever a hut was destroyed, or a settlement fired, quantities of interesting material were entombed in the lake. Children playing on the gangways would drop articles in the water, and in many other ways the lake-bottom was enriched. In some of the smaller lakes an accumulation of peat took place over the lake-bottom, and helped to preserve the relics for us. In this way we are enabled to build up a fairly ample picture of the life of late Neolithic man.

There is abundant evidence that agriculture was now well developed. We trace three kinds of wheat, two kinds of barley, and two kinds of millet in the debris. Quorns for grinding or bruising the corn—not unlike the stone quorns still in use in many places—are also found, and we even have fragments of the cakes into which the rough flour was baked. Rye and oats come later, in the Bronze Age. Many writers see a significance in the early domesticated plants of Neolithic man. Dr. Hoernes points out that Babylonia and Egypt got their barley and wheat from the north, and that the native home of these plants was probably on the Asiatic plains.* This may be recalled in connection with other indications that the race came from the direction of Asia.

There are traces of fruits and berries, and there is ample proof of cattle-rearing. Oxen and goats were early domesticated (as well as the dog): the sheep, horse, cat, and fowl come later, or are only found in abundance when we enter the Bronze Age. In some places the cattle seem to have been brought on to the settlement from the fields at night. We have, apparently, traces of dressed hide, or leather, as if some kind of foot-covering was made. Though clothing may still have consisted largely of animal skins, we find that the pile-dwellers could weave, and fragments of the coarse fabrics they made have been preserved. Wild flax was the chief material used, together with straw. Numerous stone spindle-whorls are found. A great

* *Primitive Man*, 1900 (Temple Primers).

taste for personal adornment is shown as we approach the Bronze Age, and certain clay balls, with stones in them, are regarded as children's toys.

From all these details we obtain a fair picture of life in Europe before the age of Metal sets in. A hut that was carefully traced proved to be an oblong structure, 33 feet by 23, divided into two chambers. It had its door and fire-place, and probably walls of wattle and mud, with a thatched roof of grass or reeds. The domestic life shows us the culmination of the Stone Age—a long stride from the naked repulsive wanderer of the river-drift to the ordered and well-built home in a protected settlement, with wife cooking in clay vessels or making cakes and tending the little ones, while the father rears his cattle or his grain on the lake-shores. Here again, however, we trace a gradual growth: indeed, it is nowhere more apparent than in the Alpine settlements. We have not only the direct transition from the Stone to the Bronze Age, but some succession can be observed in the New Stone settlements themselves. The making of implements becomes more refined in finish and in choice of materials, and the clay pottery takes on a higher degree of ornamentation. The animals also are domesticated successively, the dog and a small ox appearing first under human control. In some places we find three settlements in succession on the same site, each indicating a higher grade of culture.

What the relation of these pile-dwellers was to the earlier Neolithic men, and how far their development was influenced by a new, bronze-using race, must be considered later. We shall return to the pile-dwellers in the

next chapter, when we shall find them in possession of a rich collection of bronze, before they are finally destroyed or driven away at the beginning of the Iron Age. Our picture of Neolithic life has first to be completed by a consideration of the stone monuments which are still so liberally scattered over Britain, and other parts of the world, after a lapse of several millennia.

The Neolithic men of the pile-villages do not seem to have erected any of the stone monuments which are so closely associated with their age. It is another point which confirms some theorists in the belief that they had invaded Neolithic Europe from Asia, along the valley of the Danube. In other parts of the earth, however, and especially in Britain, Neolithic man has left enduring memorials of his activity in the "megaliths" or large stone erections, which were until recently ascribed to the "Druids"

Such monuments may be roughly classified as single stones or menhirs, table-stones or dolmens, round circles or cromlechs, obvious tombs or barrows (long and round), lines and avenues and large circles of stone. The meaning of these erections has filled whole volumes of controversy. To-day—setting aside an astronomical theory, which we will consider—the tendency is to take the barrow as the complete type, and interpret the rest in harmony. The barrow is found to cover a Neolithic grave or graves, and most of the megalithic constructions seem to be either reduced relics or enlargements of it, or in some way connected with the homes of the Neolithic dead. We will, therefore, consider the barrow first.

When Paleolithic man, or rather, his Neolithic descendant, left his cave-home, and began to build huts, it is assumed by many that he more or less imitated the form of the cave in his construction. The hut of the modern Eskimo is regarded as a fair illustration of what he would do; to some extent we might add the ancient British hut, which we shall consider shortly. The inference is precarious, since we have only late Neolithic models. If we refer to the practice of savages for instruction, we usually find that the first hut is merely a screen made from the branches of trees. However that may be, it is clear that man had begun to bury his dead in caves, and many writers believe that the barrow is an attempt to imitate the traditional place of burial, when interment was necessary in a cave-less district.

The conjecture is somewhat airy, but the nature of the barrow is sufficiently consistent with it. The Neolithic home of the dead consisted essentially of two or more large stones, raised on end, with a large and massive capstone. Under the shelter of these the remains were placed, and a huge mound of earth was then deposited over it. This is the simplest type of barrow or "tumulus." In many cases it was usual to bury many people under the same tumulus, and there might then be several chambers in the barrow, with a long, stone-covered passage, and sometimes more than one entrance. In more important caves a series of up-turned large stones might be placed round the edges of the mound of earth, to strengthen or adorn it. In others an avenue or line of stones might mark the approach to it. Thus the cave of the dead differentiates

into many forms, and most of the stone-monuments of this country seem reducible to it in one way or other.

In many cases the mound of earth has been removed, either by natural causes or human cupidity—farmers have been known to cart it away even in recent times—and the stones which once covered the death-chamber are left exposed. We should thus get a dolmen like the famous Kit's Coty Hole, in Kent, and the innumerable dolmens of Denmark. In other cases only the encircling stones may appear, and we get a cromlech. In other cases again one single gigantic stone may remain, reared on one end, and we have a menhir, or monolith. It is clear that in this way we have a plausible theory of most of our stone-monuments, but there are other theories which the student has to bear in mind. Sir Norman Lockyer, who has for some years paid close attention to our stone-monuments, believes that the astronomical clue is more likely to lead to a correct interpretation. The dolmens would, on this theory, be observatories, from which the position of the sun could be accurately determined, and the calendar indicated. We know that the early British priests, having a solar cult, must have made such observations (like the Babylonian, Persian, and other priests). The barrows and dolmens, however, go back much earlier than Druidism, and we know nothing of pre-Druidic religion in Britain. The theory applies more particularly, as we shall see, to the greater monuments.

The distribution of dolmens by no means coincides with the area covered by Neolithic man. The map given in Cleuziou's *Création de l'homme* shows that

they are found most abundantly in India and in Western Europe, with a faint offshoot in the further East (Japan) and a few patches—as of stations on a line of march—between India and France (Syria, the Caucasus, Greece, Corsica and Sardinia, and North Africa). In the south of Spain and Portugal they are found in increasing abundance, and the line travels round the west coast of Spain to France. In the latter country they are very numerous, and the line is then continued through the west of England, Wales and Ireland, Scotland, North Germany, Denmark, and Scandinavia. This peculiar distribution has given rise to much conjecture in regard to the race of dolmen-builders, but before we can consider such speculation a word must be said on the classic distinction of “long” and “round” barrows.

The distinction of skulls, to which we have already referred, into “long” and “round” (or short) was found to apply to barrows, and it has been established that the long barrow covers dolichocephalic remains, while the round barrow reveals the site of a brachycephalic burial. It was further established that the long barrows—take, for instance, the mound at Uley, which measures 120 feet by 85—all belong to the Stone Age, while the round barrows contain bronze implements. Some doubt has been thrown on this distinction of late years, but it does not seem to have been sustained. The long barrows sometimes contain scanty gold ornaments in France and Scandinavia—a proof that we are near, or in, the age of metal—but they are overwhelmingly Neolithic. A further distinction, as Dr. Windle points out, is that the long barrow is usually in the nature of a

collective vault; the round barrow a single tomb.* The round barrows also occur in groups, or circles.

The mode of burial is another element of confusion. Both cremation and inhumation are practised, in both types of barrows, and it is impossible to sift out any general principles from the mass of evidence. In the Neolithic graves, it is true, we find cremation predominant in the north of England, and inhumation in the west; but no explanation of this is given, and in the round barrows we have—as the explorations of Dr. Thurnam and Canon Greenwell have shown—an extraordinary difference of practice in the different counties of England. In some cases burnt and unburnt bodies have been buried simultaneously; though in these cases it is suggested that the unburnt body may be that of the chief, and the charred remains those of his household or slaves who may have been despatched with him, according to a custom that was known to many races.

It will be seen, therefore, that as far as the Neolithic period is concerned, we meet very serious difficulties in attempting to trace the identity of the mound-builders. The most generally received theory is that two races spread over Europe during the Neolithic period. The first and more primitive race—commonly known as the Iberians or Ivernians or Euskarians in the west, and the Pelasgians, etc., of the south—displaced Paleolithic

* Naturally, the barrow is not an ordinary Neolithic or Bronze grave, but the tomb of some man or woman of distinction. The scarcity or abundance of stone may also affect the question.

man, and spread the early Neolithic culture over Europe. Whether this race was a continuation of the Paleolithic, or an intrusion from Africa or Asia, is disputed. It is generally held to survive in the Picts of Scotland and the Basques. Later, on the commonly received theory, there was a fresh displacement of the population, and the new-comers are associated with the supposed Aryan race, the theory of which is modified in various ways. Many writers now hold that the Aryans were developed in Eastern Europe, or, at the most, in Western Asia—not in Central Asia. Most writers admit that they did not bring a higher civilisation, but had the character of comparative barbarians.

The question is important, because it must supply the key to the problem of the origin of the actual European races (apart from known Asiatic intrusions, such as the Magyars and Turks). Unfortunately, we are scarcely nearer agreement than in the days when the old Aryan theory was first discredited. The old theory was attractive in its simplicity. The Aryan race was located on the tableland to the north-east of India. From that point a branch passed into India, another branch into Persia, and a further branch into Europe, to split into the familiar cognate nations of Kelt, Teuton, Slav, Greek, and Roman. The earlier Neolithic population was either absorbed or extinguished, save for the surviving fragments of the Basques and the Picts. This theory has, however, been strongly assailed by philologists, craniologists, and sociologists, and until a few years ago one hardly dared to speak of the Aryan race.

The chief modification of the older view was to

introduce first a brachycephalic non-Aryan race from Asia, along the valley of the Danube, and make it mingle with, and largely displace, the older dolichocephalic race. Later—one writer puts the date at about 2500 B.C., but most would make it much earlier—the tall, blonde men of the Aryan race proper are said to fall upon this Alpine (or Celtic, or Ligurian) race of short, dark men. On this theory the short, dark element in Southern and Western Europe would belong to the non-Aryan Neolithic, and the tall, fair element to the Aryan. Others, however, following Professor Sergi, re-unite the blonde and the dark in a common "Mediterranean race." This race is represented as having three main branches—the Afric (seen in the actual Libyan tribes), the Iberians, Ligurians, and Pelasgians of the three South-European peninsulas, and the Nordic or Teutonic. This great race was non-Aryan, and gave rise to the early Latin and Greek civilisations. The Aryans were a Eur-Asiatic race, who partly destroyed the Eur-African civilisation, and imposed their languages on the non-Aryan peoples.

Others, again, hold that the Aryans—many German writers identify them with the Teutons, and French writers with the Celts, while Taylor holds that the Lithuanians are the original Aryans—were evolved in Northern or North-eastern Europe, and descended thence upon Greece and Italy. Matters are still further complicated by a recent contention of Mr. Gray, an acute student of geology who has made a close examination of the stone circles of Britain, that these monuments are due to an intrusion of a totally different people,

probably of Akkadian (Turkic) affinity, who worked their way from the south-west of England to the north of Scotland.* Finally, Professor Ridgeway has lately endeavoured to undermine the whole principle of classification and its outcome in theories of migration. He points out that a high latitude is known (as in the case of the Mongols) to modify the shape of the skull and make it shorter, and that therefore the Alpine race (which Sergi describes as Aryan, and others as non-Aryan) may have been developed in that mountainous region itself from a dolichocephalic stock. The mountainous regions of Anatolia, Albania, etc., may have had the same effect in producing brachycephalic peoples, so that we need not multiply invasions. He further contends that the imposition of languages on conquered races is opposed to the facts of history, and thus rehabilitates the older argument (from community of language) for the unity of the Aryan race.† The Basques he conceives to be the relic of an intrusion from Africa.

It is impossible to enter further here into the perplexing problem of the Neolithic population of Europe, and I will be content to resume in a few lines the trend of speculation. Apart from the Basques there is no admitted proof of pre-Aryan tongues in Europe, but it is unknown whether early Neolithic man developed in Europe from Paleolithic, or came from Africa or Asia.

* *Nature*, December 24th, 1908.

† Presidential speech to the Anthropological Section of the British Association, 1908 (*Nature*, September 24th).

I have given certain indications which point to immigration, and North Africa seems to be the likeliest source. There are then strong grounds for suspecting three successive further immigrations, or at least irruptions into known from unknown parts of Europe. One race seems to have penetrated by way of the Danube valley—the “Alpine race” of most writers; another race—the monument-builders—seems to have come by way of North Africa, Spain, France, and Britain, to Scandinavia. Possibly both these movements start from the fermenting region, on the border of Asia and Africa, where civilisation first appears, and may be connected. The third immigration is that of the Aryans. But the exact relation of these races to each other and to the later peoples of Europe is not yet determinable.

We see, therefore, that the abundance of dolmens, cromlechs, and tumuli does not carry us much further into the racial problem, which is now the central problem of prehistoric science. Nor do the remaining stone monuments give much assistance. These are, we saw, stone circles, lines and avenues of standing stones, and large monuments like Avebury and Stonehenge.

Circles are divided by Dr. Windle into five groups: (1) circles composed of cists (graves, or small dolmens); (2) circles of stones which once surrounded a mound, either for support or as a superstitious fence to keep the spirits from wandering; (3) stones which were at one time within a barrow that has disappeared; (4) small circles surrounding a grave; (5) great circles like Stonehenge. Dr. Windle claims that the first four classes are obviously of funereal origin; though we must

bear in mind Mr. Gray's contention, on the ground of the peculiar skulls associated with them, that the chief circles (Dartmoor, Aberdeenshire, and Invernesshire) are due to a race of oriental affinities.

Alignments and avenues of stones may be indications of burial-sites, or monuments connected with solar or other worship. Both theories have distinguished supporters; and indeed there have been suggestions made of serpent worship in connection with some of the lines. The great monument at Karnac is the supreme example of this kind of construction. Of this immense procession of standing stones, more than a mile in length, there were still 4,000 standing in the eighteenth century. The natives had a theory that they were the petrified remains of a legion of Roman soldiers, who had been turned into stone by St. Cornelius. As the same natives religiously repaired thither to light bonfires at the summer solstice, many claimed that there was in this a trace of a connection with the ancient sun-worship.

Stonehenge has been the subject of endless speculation. Mr. A. Evans concluded some years ago that Stonehenge was probably of the same age as the neighbouring barrows, and therefore only went back to about 250 B.C. More recently the date has been assigned at between 1800 and 1700 B.C. Professor Gowland suggested the former date on archæological grounds, and Sir Norman Lockyer, who regards it confidently as a solar temple and observatory, found that the date of construction would, on the astronomical theory, be about 1700 B.C. A very close inquiry was

made in connection with Sir N. Lockyer's research, and it was concluded that the present monument was built on the site of an earlier vast structure. Hence, though the present structure was raised by the bronze-using Kelts—who apparently used stone implements in building it—the temple or monument belongs really to the earlier Neolithic population. It is believed that the outer circle originally consisted of thirty stones, with a continuous capital, and a diameter of about 100 feet. Other writers regard it as a monument to the dead, or as an assembly place.

The Avebury monument is believed to have been the most imposing of all in its pristine splendour. There were, apparently, two inner circles of stones, surrounded by an outer circle of 100 stones, each from 15 to 17 feet high. The fosse is still 40 feet deep in places, and encloses (with the rampart) an area of $28\frac{1}{2}$ acres.

A further proof of the religious feeling of Neolithic man is seen by some writers in the fact that, from the beginning of the New Stone Age we find trepanned skulls, and also find that the pieces removed are worn as amulets*. It is conjectured (Broca) that the operation, which was performed with a sharp flint knife, was designed to let out an evil spirit; or (Munro) that the aim was to relieve bodily or mental disease, and the cranial fragment afterwards worn as a charm. The operation speaks well for the skill and intelligence of Neolithic man, but the inference as to his superstitious

* See, especially, a chapter in Dr. Munro's *Prehistoric Problems*. Broca also urges the conclusion.

feeling is not very safe. Among savage nations which practise the operation to-day the aim is purely surgical.

Only two other relics of Neolithic man remain for consideration. There are the "souterrains" (or "dene-holes") and "hut-circles" (or "pit-dwellings"), of which we have many examples in England. The underground chambers are probably storehouses, and may belong to the British period. The pit-dwellings are earlier, and seem to indicate the earliest type of house of which we have direct knowledge. A hole, twelve to thirty feet in diameter, and three to six feet in depth, was dug in the ground. The earth was often heaped round it, possibly to keep out water. The roof seems to have been of branches covered with turf, and, if necessary, supported by a central tree or pole.

CHAPTER VII

THE METAL AGE AND THE DAWN OF HISTORY

IF the New Stone Age has proved a period of comparative brevity after the slow, stupendous length of the Old Stone Age, the Metal Age will now prove to be far briefer as a prehistoric epoch. In one sense the Metal Age is not prehistoric at all. I mean that the historical period had opened in Egypt, and probably in Mesopotamia, before we have definite traces of the use of bronze. We have now to be more careful than ever to distinguish phases of human industry rather than chronological stages. Mankind is now a vast family scattered over the entire earth, moulded in a hundred racial moulds, with a few of the more fortunately situated branches of the family outstripping the rest. There is no longer the least approach to uniformity, and so not the least question of a successive series of stages for the race.

How this diverse population of the world came about is a problem we ought to consider before we enter upon the last phase of our subject. We have seen, however, that the racial question, if one of the most interesting, is one of the most difficult in the whole of the science.

The speculations I have previously given relate only to that interesting group of races which used to be called "Aryan" or "Indo-European," though we saw that the theory of this great central race has been considerably modified. Broadly speaking, the various existing races may be ranged in three great groups. Though colour is not a safe criterion of race—since it varies with latitude—this broad classification may take as its basis the rough popular division into black, white, and yellow or red races.*

In other words, the Siberians, Tunguses, Mongols, Koreans, Turki, Ugrians, Eskimo, and American Indians, form one of the great divisions of humanity, the "straight-haired" men, or *Leiotrichi*. The negroes and negroids form another great group—the Bushmen, Hottentots, Sudanese, and Bantu of Africa, with a black strain running across the Indian and Pacific Oceans (the Adamanese, Semang of Malasia, Papuans, Melanesians, and Aetas, of the Philippines). These are the "woolly-haired" varieties. There then remains the vast group of the "wavy-haired" races, now scattered over the entire earth, embracing some of the very lowest and most of the highest races of men. In this group the Veddahs, the Australians, the Sakai, and many of the lower tribes about India, are brought together with

* See the previous volume in this series by Professor Haddon, *Races of Man*.

the Indonesians, Polynesians, Hamites (Ethiopians), Semites, and the Alpine, Mediterranean, and Nordic (Teutonic) races of Europe.

Ethnology has no less difficulty than prehistoric science in determining the genealogy of these three groups of races. All that we can say is that ten thousand years ago the main lines of the population of the earth were established. The "yellow" men had streamed off into Eastern and Northern Asia, left a branch to become the Eskimo in the Arctic, and sent an offshoot into America to become the "red" Indians. The negroids had established themselves in Africa, and along the island track which I indicated. The third primitive stock had flung out branches eastward into Australia, New Zealand, and the Pacific islands, and westward into India, Persia, Arabia, Syria, the whole strip of Northern Africa, and the whole of Europe (the Neolithic invaders).

Setting aside China, the antiquity of whose culture it is impossible to determine, civilisation began, some 10,000 years ago, at a central part of the "Caucasic" or "wavy-haired" world. Flinders Petrie and others put the beginning in Egypt at about 8000 B.C. For something like 2,000 years we have a broken record—we are still in the prehistoric age—of a native race evolving its own civilisation, with constant irruptions from the immediate east and west—from Asia and Africa. In some of the earliest graves we

find copper pins, as well as pottery. The copper-implements increase, and the artistic quality of the pottery and ornamentation increases, as the period of prehistoric civilisation proceeds. Towards its close we get carvings on slate which show much the same variety of races as we know to-day; we have also ample testimony to the growth of shipping, commerce, fighting, and the peaceful arts of civilisation. This prehistoric culture decays, however, and the dynastic race, with historical records, begins its new civilisation about 5800 B.C.

Recent writers on Egypt are by no means unanimous on this early struggle of races from east and west with an aboriginal population, but, with that reserve, we may follow Mr. Flinders Petrie. The new dynastic race, bringing the historical civilisation, came, he concludes, from the direction of Arabia. Now, the other great civilisation of the ancient world appears about the same period, and its beginning is traced to the same mountainous region of Northern Arabia or Southern Syria. A people of mongoloid character—the Sumerians or Akkadians—is discovered at Susa with a primitive civilisation about 6000 B.C. By 5000 B.C., when Babylon was much nearer the sea than now, it has passed into the lowlands of Mesopotamia, and founded the great civilisation of that valley. A thousand years later the civilisation was taken up from the older Turkik or Mongol stock by a Semitic people, and the history of the Babylonian empire begins.

Thus we have a great centre of fermentation in the region which unites Africa and Asia about 10,000 years ago, and that disposes one to regard the region as the ultimate source of the successive invasions of higher races into Europe. Of the course of civilisation in the farther east it is difficult to treat. The Chinese and Indian civilisations seem to have developed separately, and independently of Europe. The difficulty which some experience in attributing the independent evolution of civilisation to remote China seems to be removed by the fact that the American branch of the "straight-haired" race did undoubtedly evolve a civilisation of its own, in Mexico, Central America, and Peru; although it had the horrible blemish of human sacrifices (like most early civilisations) there is evidence that it was outgrowing this. Isolation is, however, fatal to progress. The great principle of progress has ever been the clash of races and contrast of cultures. The geographical position of the Afr-Asiatic region is the chief secret of its advance.

With this dawn of civilisation the life of man now becomes so complex that a small manual like this cannot hope even to summarise the advance from the Stone Age. That it was a very gradual advance the Egyptian remains amply illustrate. Its earlier civilisation is almost purely Neolithic. There is not even weaving, which we found in the Swiss Neolithic villages, in the earliest phase. There is, as in the Neolithic, a deep

concern for the disposal of the dead, and early in the prehistoric civilisation of Egypt there are definite cults of deities. The chief advances, however, are the use of metal and of written language, and we may confine attention to these.

The origin of spoken language is still so purely a matter of speculation that it cannot be treated here. The impossibility of linking together the remoter groups of languages suggests that they were evolved after the wide dispersal of the human family, and we saw reason to doubt whether Paleolithic man had articulate speech. Undoubtedly the social life of the late Paleolithic would force the development of some medium of communication. Sounds which were instinctively used would be recognised to have a conventional value — we have permanent sound-expressions in the dog and ape, and other animals — and the association of these sounds with objects or actions would extend. Gesture would eke out the scanty speech in the early days. The Tasmanians had, in the nineteenth century, so poor a speech, and had to supplement it so largely by gesture, that it was difficult to converse in the dark. Many tribes cannot count beyond three or four. Whether, however, verbs were largely made by imitating the noise of the action to be expressed is now much disputed.

The origin of written language is easier to follow. In the ancient Chinese, Assyrian, and Egyptian writing we

have a very clear trace of the development. The ancient Egyptian writing, which we trace back to 7000 B.C., was—as the hieroglyphics have made generally known—a series of pictures of the objects to be represented. The transition to this from a sheer picture-message is clear; and it is not difficult to imagine how a phonetic alphabet, or a conventional use of a character, would in time arise from the picture-writing. The Chinese symbols of to-day seem far removed at first sight from pictures of objects, but the ancient characters show their gradual degradation. A Chinese character is a word, not a letter in the European sense, and in the early forms the character was a picture of an object. "Chariot" was represented by a drawing of a chariot, and so on. The Assyrian cuneiform characters also seem, in their later form, far removed from pictures, but they are clear enough in the earlier forms. As, however, the picturing had to be done with a series of dabs, of a triangular instrument on a clay surface, the outline of the object was roughly represented by a number of disconnected marks, and the character easily degenerated.

To this plausible theory of the origin of the alphabet, however, there are objections. That it explains the origin of the hieroglyphic, cuneiform, and Chinese scripts may be admitted, but the difficulty of deriving the European alphabet from them is very great. Egyptologists are looking rather to certain marks or "signaries,"

which are found in pottery as far back as 7000 B.C., and which coincide to a great extent with the earliest European "signaries" of some centuries before Christ. French scholars, on the other hand, are maintaining that the painted pebbles of the cave of Mas d' Azil (transition to the Neolithic) show markings which look like a beginning of the early alphabet. Possibly further discoveries will throw light on the question.

The other distinctive advance of humanity as it approaches the historical period is the discovery of the use of metals. We have so often appreciated the difficulty of arranging prehistoric remains in chronological order that we cannot be surprised to encounter fresh difficulties in connection with the beginning of metal. The Paleolithic period was so long that we confidently distinguish at least its earlier from its later phase. We are in a fair position to do so in the Neolithic. But when we come to deal with a shorter period we need a finer standard of chronology than is yet available in prehistoric science; and the difficulty is enormously increased from the fact that very different levels of culture exist simultaneously in different parts of the world. After exhaustive controversy the authorities are now generally agreed that bronze was used before iron, and copper before bronze.

Writers who approach the subject from a theoretical point of view object that iron would be the most likely metal to meet the eye of primitive man. Meteoric

iron is ready for fashioning into weapons, and even iron ore might be found smelted by volcanic agency or the unintentional fire of Neolithic man. In point of fact, however, iron implements are not found except at a level which puts it later than the general use of bronze. The painting of certain weapons blue or black on the Egyptian papyri undoubtedly represents iron, and this occurs at a very early date. The word "iron" is also very early, and a piece of iron has been found in the remains of the fourth dynasty. This, however, does not show a practice of smelting and moulding iron, or anything like a general use of it. The beating of native iron into rough weapons may meet the case. On the other hand, iron is plainly far later than bronze in the graves of Europe, and what is called the Iron Age is decisively dated at not earlier than the thirteenth century before the Christian era. Bronze was in common use, even in Britain and Scandinavia, many centuries earlier.

Copper, as we saw, is found in Egyptian remains about 8000 B.C., and during the course of the pre-dynastic civilisation an increasing variety of implements are made from it. In Ireland, Hungary, Italy, and other regions we seem to have a similar precedence of copper. This metal would in many parts be found pure, and could easily be fashioned into implements (chisels, knives, etc.) or weapons. It is, therefore, generally felt that the age of metal opens with a copper phase, though this is far from being universal or simultaneous.

Copper is, however, too soft a material for either tools or weapons, and we find it speedily hardened with an alloy of tin, in the shape of the familiar bronze. The normal proportion is nine parts of copper to one of tin, but in the earlier weapons, or in regions where tin is scarce, the proportion of tin is much slighter. Where and when the manufacture of this alloy first took place is a matter of dispute. In Denmark and Scandinavia, where very rich bronze remains have been discovered, it has been possible to assign the eighteenth or seventeenth century before Christ as the beginning of the period. It was introduced into Britain by the invading Kelts about the same time, and we are clearly thrown further east for the original manufacture.

The earliest European civilisation (probably of Asiatic origin) is known as the "Ægean," and is dated between the thirtieth and twentieth centuries before Christ. This was responsible for the spread of bronze over the Balkan peninsula, the valley of the Danube, the Swiss lakes, and the north of Italy. The use of bronze is much older than this in Egypt. A bronze rod found at Medum dates from 3700 B.C.; and bronze articles, of native make and advanced character, are found in Mesopotamia belonging to 2500 B.C. These are the earliest known articles,* but an objection is raised to our locating the origin of bronze in Egypt or Babylonia

* In the discussion on Professor Hildewey's paper on the Iron Age—which I discuss presently—Prof. Flinders Petrie speaks of bronze as being known in Egypt by 4800 B.C., but not in common use until 3,000 years later. Most implements were still of stone.

on the ground that tin is not found in or near those regions. It is found in parts of Persia, and was possibly found at one time in Arabia. Some have conjectured that bronze was really initiated in China, and transferred to the west.* As we find commerce well developed in Egypt long before 4800 B.C., and in Babylonia before 2500 B.C., we may dispense with this hypothesis.

The Bronze Age slowly spread from Egypt to the Mediterranean civilisations which prepared the way for that of Greece. The excavations in Asia Minor have laid bare a civilisation — Hissarlik — going back to 2500 B.C., and showing the beginning of bronze culture. The citadel-hill of Troy was found to contain the successive ruins of six or seven civilisations, in superimposed layers. The lowest and oldest city shows the first streak of copper in the Neolithic Age. The second stratum shows a civilisation possessed of bronze, of good quality. Further research, while throwing some doubt on the existence of a pure Copper Age, has considerably extended this Mediterranean culture. We now know that it spread over the islands of the Ægean Sea, and its influence extended into Central Europe, along the valley of the Danube (Austria-Hungary, Bosnia, and Switzerland). Crete and Cyprus were important centres. Indeed Crete passed from Neolithic to Bronze civilisation as early as 3000 B.C. By 2500 B.C., the

* See the able discussion of the whole metal question in the introduction of Mr. Read's *Guide to the Antiquities of the Bronze Age* (British Museum). This volume and its predecessor (*Stone Age*) and successor (*Iron Age*) are of the greatest value to students.

period of the second and most prosperous Hissarlik culture, art and luxury advance considerably, and it is impossible to enumerate the classes of weapons, pottery, etc., found in the excavations.

The relations of this civilisation to Egypt and Babylonia on the one hand, and Europe on the other, are not wholly clear. One would be naturally disposed to regard the *Ægean* as transmitting the culture of the further east to Europe, but strong claims are made for native development (with oriental influence on forms of decoration), and there is no reason why civilisation should not have developed at more than one centre. Perhaps the dispute may be evaded when we recollect that shipping and commerce were well developed by the third millennium B.C., and a completely independent development is hardly admissible. Crete, the chief centre of Mediterranean culture, was in constant communication with Egypt long before that time.

On the other hand, the position of the *Ægean* culture as a centre of radiation over Europe is clear enough. Not only does the *Ægean* civilisation lead on to the Mycenæan (at its height about 1500 B.C.), which in turn prepares the way for the later Greek development, but its culture spreads fairly rapidly over Europe. It is assumed that bronze was in use in the *Ægean* between 2500 and 2000 B.C., and we saw that it reached remote Britain and Scandinavia by 1800-1700 B.C. It was somewhat earlier in Switzerland, Austria, Italy, Spain, and France. The Swiss lake-villages again exhibit the transition with singular clearness, and they and the bronze graves supply a vast variety of weapons, utensils,

and ornaments—swords, spears, chisels, fish-hooks, pins, bracelets, sickles, etc. The bronze axe is at first an imitation of the stone model, and we can trace its gradual divergence into more specific forms. The articles of personal adornment have a peculiar interest. We find brooches, with fasteners of the safety-pin type, and bronze hair-pins recalling the elaborate hair-dress of the modern geisha. The pottery also advances in make, but the consideration of its many types cannot be entered upon here.

Before many centuries Europe passes into the last phase of prehistoric culture. Europe was now advancing so fast in culture, while the older empires were showing signs of decay, that we are not surprised to find the claim that the use of iron originated in this continent. Although iron had been known in Egypt for some thousands of years, it was not in general use, and it is suggested that the Egyptians merely employed hæmatite as a hard stone for making implements, and did not smelt it. The Iron Age does not begin in Egypt until about 800 B.C. There are no reliable indications of its use in Babylonia or Persia before that date. On the other hand, the iron industry breaks out with great vigour in Europe before the end of the second millennium B.C.

Austria and Germany were on the line of the trade-routes to the Baltic (for amber) during the Bronze period, and were early quickened with the advancing culture. It is at Hallstatt, in the Austrian Alps, where we first get a great iron industry. In the thirteenth or twelfth century, B.C., much earlier than any develop-

ment in the older civilisations, the first Hallstatt period of the Iron Age began, and from the Austrian Alps the use of the new metal spread over Europe. Italy had it in the twelfth century B.C.; Scandinavia and Britain received it from 500 to 300 B.C. A second Hallstatt period is dated from the tenth or ninth to the sixth century B.C., and the industry then centres at La Tène, in Switzerland.

How far the Iron Age is to be regarded as prehistoric, is, perhaps, a question of words, but it is beyond both the scope and the limits of this book to discuss it in detail. The only question that remains for discussion is that of the successive migrations into Britain of men with metal implements, before the Romans open the historic period in this island.

We have seen that Britain and Ireland were populated in the Neolithic by a branch of the European race, of which many still see a remnant in the Basques. Apart from certain claims of later invasion—apart from Sir W. Turner's claim of a Neolithic invasion of Scotland from Scandinavia and Mr. Gray's theory of the passage of an oriental people from South-west England to the north of Scotland—the general opinion is that this Iberian or Euscarian race remained in possession until the bronze-using Kelts invaded the island. A late limit for this invasion is fixed as the sixth or fifth century B.C., but most writers consider that it occurred much earlier.

This branch of the Keltic race was known as the Goidhels, and has founded the "Gaels" of Ireland and Scotland. They are believed to have been in turn

displaced by a fresh Keltic wave from the Continent a few centuries before Christ. The Brythons drove the Gaels west and north—to Ireland and Scotland—and it is believed by many that the last remnant of the earlier Neolithic population was pressed to the north of Scotland, and survived to Cæsar's time in the "Picts." Certainly, the distribution of races in the United Kingdom harmonises with the theory; but it must be added that the efforts of philologists to detect linguistic elements of the older language in Scotland and Ireland meet with distinguished opposition; nor does the examination of skulls yield any clear conclusion. On the other hand, the later displacement of the Brythons by the Belgians, Romans, and Saxons, and their establishment as the Kymry in Wales, belongs to the domain of history.

THE END.

BIBLIOGRAPHY



- Cleusiou, H. du—"La Création de l'homme," 1887.
840 pp.
- Clodd, E.—"The Story of Primitive Man," 1895.
206 pp.
- Dawkins, W. Boyd—"Early man in Britain," 1880.
537 pp.
- Deniker, J.—"The Races of Man," 1900. 611pp.
- Evans, Sir J. — "The Ancient Stone Implements,
Weapons, and Ornaments of Great Britain," 2nd
edition, 1897. 747 pp.
- "The Ancient Bronze Implements, Weapons,
and Ornaments of Great Britain and Ireland,"
1881. 509 pp.
- Haddon, A. C.—"The Races of Man and their Distribu-
tion," 1909. 126 pp.
- Hoernes, M.—"Primitive Man," Eng. translation, 1900.
135 pp.
- "Der Diluviale Mensch," 1903. 227 pp.
- "Natur und Urgeschichte des Menschen," 1909.
In parts.
- Johnson, J. P.—"The Stone Implements of South
Africa," 1907.
- Keane, A. H.—"Man, Past and Present," 1899. 584 pp.

- Laing, S.—“Human Origins,” 6d. ed., 1903. 142 pp.
- Lockyer, Sir J. Norman—“Stonehenge and other British Stone Monuments astronomically considered,” 1906. 340 pp.
- Lubbock, Sir J. (Lord Avebury)—“Prehistoric Times,” 6th ed., 1900. 616 pp.
- “The Origin of Civilisation,” 6th ed., 1902. 577 pp.
- MacCurdy, G. G.—“The Eolithic Problem,” 1906.
- McCabe, J.—“Evolution: A General Sketch from Nebula to Man,” 1909. 128 pp.
- Mortillet, G. and A. de—“Le Préhistorique,” 1900. 709 pp.
- “La Palethnologie,” 1901.
- Munro, R.—“Prehistoric Problems,” 1897. 371 pp.
- Muller, Sophus—“Urgeschichte Europas,” 1905. 204 pp.
- Read, Charles H.—“Guide to the Antiquities of the Bronze Age” (British Museum).
- “Guide to the Antiquities of the Iron Age” (British Museum).
- “Guide to the Antiquities of the Stone Age” (British Museum).
- Reinhardt, L.—“Der Mensch zur Eiszeit in Europa, und sein Kulturentwicklung bis zum Ende der Steinzeit,” 1906. 504 pp.
- Schwalbe, G.—“Studien zur Vorgeschichte des Menschen,” 1906. 228 pp.
- Schweinfurth, G.—“Recherches sur l'age de la pierre dans la haute Egypte,” 1905. 56 pp.

- Schoetensach, O.—“Der Unterkiefer des Homo Heidelbergensis,” 1908.
- Sergi, G.—“The Varieties of the Human Species,” 1894. 61 pp.
- “The Mediterranean Race,” 1901. 320 pp.
- “Europa,” 1908. 652 pp.
- Smith, Worthington G.—“Man the Primeval Savage,” 1894. 349 pp.
- Verneau, R.—“L’homme de la Barma-Grande,” 1899. 148 pp.
- Villeneuve, Verneau, and Boule —“Les Grottes de Grimaldi,” 1906.
- Windle, B.—“Life in Early Britain,” 1897. 244 pp.
- “Remains of the Prehistoric Age in England,” 1904. 320 pp.

INDEX.



Acheulean Stage of Paleolithic Period ...	...12, 37, 38, 48
Ægean Civilisation	110, 112
Africa connected with Europe	41
Ages of Stone, Bronze, and Iron determined	6
Agriculture	87
Alphabet, Origin of	107
Alpine Race	97
Altamira Cavern	58
Amerinds	67
Andaman Islanders	27, 31
Antediluvians	7
Anthropoid Ape	36
Anthropology	3
Anthropological Society (Paris)	8
Ape Man of Java	15, 17, 27, 34, 35, 36, 53
Archæology	3
Arcy Remains... ..	32, 35
Arrows	40, 70
Artistic Faculty	49, 55, 65, 84
Aryan Race	94, 97, 102
Assyrian Characters	107
Aurillac, Eoliths of	23
Australian Native	34, 36, 81
Avebury, Lord	25, 26
Avebury Monuments	97, 99
Axe	72
Azilian Period... ..	13
Barrows	89, 92
Basques	94, 96, 114
Beever, Sir Hugh R.	26
Berber Tribe	69
Blackmore, Dr.	26, 72
Boncelles, Eoliths of	23
Bone Instruments	54
Boule, M.	35, 49, 52, 68
Bourgeois, Abbé	8, 22
Bouysonnie Abbés, J. and A.	35
Brain Development	53
Britain connected with Continent	41
Britain, Earliest Inhabitants	27

Broca, M.	...	...	...	...	8, 99
Bronze	...	...	...	...	74, 108, 109, 110
Bronze Age	...	...	...	...	82, 86, 87, 88, 111
Brown, Mr.	...	...	...	...	64
Bruniquel Remains	...	...	...	...	52
Brünn Remains	...	...	...	...	51, 67
Brux Remains...	...	...	...	...	32, 51, 67
Bulb of Percussion	...	...	...	...	38
Burial of Dead	...	...	...	...	44, 51, 70, 90, 106
Bury St. Edmunds Remains	...	...	...	...	32, 50
Bushmen	...	...	...	...	68, 81
Caanstadt Race	...	...	...	...	69
Calaveras Skull	...	...	...	...	23
California Remains	...	...	...	...	23
Cambarolles Cave	...	...	...	...	58
Cave-bear Period	...	...	...	...	37
Cave Men	...	...	...	...	12, 37, 54
Cave Period	...	...	...	...	50
Celt Flints	...	...	...	...	38
Cervidian Period	...	...	...	...	38
Chancelade Remains	...	...	...	...	52, 67
Chapelle-aux-Saints Remains	...	...	...	...	35, 36, 44
Chellean Implements	...	...	...	...	46
Chellean Stage of Paleolithic Period	...	...	...	...	12, 37, 48, 49, 50
Chinese Language	...	...	...	...	107
Chopper	...	...	...	...	72
Chronology, difficult to determine	...	...	...	...	15, 29, 108
Civilisation, Beginning of	...	...	...	...	103
Civilisation's first development...	...	...	...	...	70
Classification of Relics	...	...	...	...	37
Clichy Remains	...	...	...	...	51
Climate of Europe in Miocene Period	...	...	...	...	26
Clodd, Mr.	...	...	...	...	83
Clothing	...	...	...	...	40, 46, 49, 59, 87
Colour as Criterion of Race	...	...	...	...	102
Commanders' Batons	...	...	...	...	58
Copper	...	...	...	...	108, 109
Coup de Poing	...	...	...	...	38, 39, 40
Crannoges of Ireland	...	...	...	...	85
Cromlechs	...	...	...	...	91
Cro-Magnon Skeleton	...	...	...	...	52, 69
Cuvier, M.	...	...	...	...	6
Darwin, Charles	...	...	...	...	4
Darwin, Erasmus	...	...	...	...	5
Darwin, Origin of Species	...	...	...	...	8
Dawkins, Prof. Boyd	...	...	...	...	65
Dene-holes	...	...	...	...	100
Deniker, Dr. J.	...	...	...	...	49
Denise Remains	...	...	...	...	51

Development during Old Stone Age	...	...	46 to 62
Diluvium	...	...	7
Discoveries treated with disdain	...	...	7
Dolmens	...	...	91
Drawing	...	...	49, 55, 65
Druids	...	...	89, 92
Dubois, Dr. Eugene	...	...	17
Duration of Geological Periods	...	...	14
Duration of Old Stone Age	...	...	47
Duration of Quaternary Period...	...	...	47
Egypt	...	...	105, 106, 107
Elephants	...	...	48
Engis (Belgium) Remains	...	...	32, 51
English Channel	...	...	42, 47
English Eoliths	...	...	24
Enguisheim (Alsace) Remains	...	...	32, 51
Eocene Period	...	...	21
Eoliths	...	11, 15, 22, 23, 24, 25, 27, 47, 72	
Eolithic Man	...	...	28
Eolithic Period	...	...	12, 28, 37, 64, 72
Eskimo	...	...	53, 57, 59, 67, 90
Europe—Climate during Miocene Period	...	...	26
Euskarians	...	...	93
Evans, A.	...	...	98
Evans, Sir John	...	...	7, 15, 25
Evolution	...	...	4
Fairies	...	...	5
Family Life in Paleolithic Period	...	...	43
Fire	...	...	44, 60
Flints found at Ightham, Kent	...	...	24
Flints found by Abbe Bourgeois	...	...	8, 22
Flint Implements	...	5, 22, 37, 38, 46, 48, 49, 54, 72	
Flint Mines	...	...	73
Flints produced by pressure	...	...	54
Flints, Sharpening of	...	...	27
French Scheme of Classification of Relics	...	...	37
Funeral Feasts	...	...	44
Furfooz Skull	...	...	52, 69
Galley Hill (Kent) Remains	...	...	32, 50, 67
Geological Divisions	...	...	14
Geology's Claim	...	...	6
German Ocean	...	...	42, 47
Gibraltar Remains	...	...	32, 50, 67
Glacial Period...	...	...	41, 48
Gowland, Prof.	...	...	98
Graves	...	...	89
Gray, Mr.	...	...	98, 114
Greenwell, Canon	...	...	93

Gough's Cavern (near Cheddar) Remains	...	...	...	...	52
Grenelle Remains	...	...	...	...	52, 69
Grimaldi Remains	...	...	...	...	68, 70, 76
Grime's Graves	...	...	...	...	73
Haddon, Prof.	...	...	...	...	102
Harpoons	...	...	...	...	49
Harrison, Benjamin	...	...	...	...	24, 25
Hauser, Swiss Explorer	...	...	...	...	33
Heidelberg Jaw	...	...	...	...	34
Hiatus between Paleolithic and Neolithic Ages	...	...	...	...	63
Hippic or Horse Period	...	...	...	...	38
Hippopotamus	...	...	...	...	42, 48
Hoernes, Dr. M.	...	...	15, 18, 19, 49, 52, 68, 87, 100	...	
Human Remains	...	...	...	...	10, 31
Human Workmanship	...	...	...	...	22
Hut Circles	...	...	...	...	100
Huxley, Prof.	...	...	...	...	8, 31
Iberians	...	...	...	...	93
Ice Age	...	...	...	...	40, 41, 48
Ightham (Kent), Flints found at	...	...	...	...	24
Implements, Stone	...	...	5, 22, 37, 38, 46, 48, 49, 54, 72	...	
Indian Ocean	...	...	...	...	19, 20
Indo-European Race	...	...	...	...	102
International Congress of Anthropology and Prehistoric Archæology of 1867	...	...	...	...	8, 22
Ipswich Discovery	...	...	...	...	38
Iron	...	...	...	...	108
Iron Age	...	...	...	...	114
Iverians	...	...	...	...	93
Java Remains	...	...	15, 17, 27, 34, 35, 36, 53	...	
Javelin	...	...	...	...	40, 49
Johnson, J. P.	...	...	...	...	29
Johnston, Sir Harry	...	...	...	...	76
Karnac Monument	...	...	...	...	98
Keane, Dr.	...	...	15, 21, 23, 25, 26, 47, 49, 71	...	
Keller...	...	...	...	...	8
Kendall, Rev. H. G. O.	...	...	...	...	77
Kitchen Middens	...	...	...	...	78
Kit's Coty Hole (Kent)	...	...	...	...	91
Klaatsch, Prof.	...	...	...	19, 23, 26, 33, 50	
Knuckle-duster	...	...	...	...	39
Kollmann	...	...	...	...	75
Krapina Remains	...	...	...	...	33, 35

Lamarck, Jean	...	...	...	...	...	5
La Naulette Remains	...	...	...	...	...	32, 35
Lance Heads	...	...	...	...	...	40, 49
Language	...	...	...	...	...	106
Lankester, Sir E. Ray	...	...	...	...	...	25, 26, 53
Laugerie Basse Remains	...	...	...	...	...	51, 67
La Vézère Skeleton	...	...	...	...	...	33, 34, 35, 36
Leiotrichi	...	...	...	...	...	102
Lemurs	...	...	...	...	...	21
Lengths of Geological Periods	...	...	...	...	...	14
Lockyer, Sir Norman	...	...	...	...	...	91, 98
Lucretius	...	...	...	...	...	4
Lyell, Sir Charles	...	...	...	...	...	8
MacCurdy, G. G.	...	...	...	...	...	24, 100
Mafflian Stage of Eolithic Period	...	...	...	...	...	12
Magdalenian Stage of Paleolithic Period	...	...	...	...	...	12, 37, 38, 49, 50, 51, 52, 54, 55, 56, 57, 60, 61, 63, 64, 69, 70, 72
Malarnaud Remains	...	...	...	...	...	32, 35
Mammoth Period	...	...	...	...	...	37, 50
Mammoths	...	...	...	...	...	48, 53, 55
Mauer Remains	...	...	...	...	...	34, 35, 36, 46
Mediterranean Race	...	...	...	...	...	83
Megaliths	...	...	...	...	...	89
Menhir	...	...	...	...	...	91
Men of Early Stone Age	...	...	...	...	...	10
Mentone Remains	...	...	...	...	...	52, 55, 68, 69, 70
Mesolithic Period	...	...	...	...	...	13, 49, 51, 63
Mesoliths	...	...	...	...	...	64
Mesvinian Stage of Eolithic Period	...	...	...	...	...	12
Metal Age	...	...	...	...	...	101
Microliths	...	...	...	...	...	77
Middle Stone Age	...	...	...	...	...	13, 63
Miocene Period	...	...	20, 21, 22, 23, 26, 28, 36, 41	...	...
Missing Link	...	...	...	...	...	18
Modern Tribes still in Old Stone Age	...	...	...	...	...	11
Monoliths	...	...	...	...	...	91
Monuments, Stone	...	...	...	...	...	89
Mortillet, G. de	...	8, 15, 22, 23, 26, 37, 40, 47, 59, 70, 100	...	...	...
Mousterian Stage of Paleolithic Period	...	...	12, 37, 48, 49, 50, 68	...	...
Munro, Dr.	...	...	...	...	...	44, 52, 99
Name of the Science	...	...	...	...	...	3
Neanderthal Man	...	7, 30, 34, 35, 36, 40, 41, 47, 50, 53, 64	...	...	...
Negroids	...	...	...	...	...	102, 103
Neolithic Period	11, 13, 15, 40, 46, 47, 49, 51, 52, 63 to 100	...	...	...	...
Neolithic Pile Dwellings	...	...	9, 72, 78, 82, 85	...	...
Neusch, Dr.	...	...	...	...	...	75
New Stone Age	...	...	...	...	10, 63 to 100	
Nude Condition of Inhabitants	...	...	...	...	40, 42, 59	

Obermaler, Dr.	...	...	...	...	39
Old Stone Age	...	...	...	10, 28, 29, 46 to	62
Oligocene Period	...	...	...	...	23
Olma Femains	...	...	...	...	51
Otta (Portugal), Flints found at	...	...	...	...	23
Paleolithic Implements	...	...	...	...	36
Paleolithic Man	...	20, 28, 30, 31, 32, 33, 35, 37, 45, 47,	76		
Paleolithic Period	12, 13, 15, 29 to 62, 63, 64, 67, 69, 70, 72,	106			
Palms growing in France and south of Britain	...	...	...	...	27
Papalian Period	...	...	...	...	38
Papuans	...	...	...	...	81, 86
Parker, St. John	...	...	...	...	39
Pelasgians	...	...	...	...	93
Petrie, Prof. Flinders	...	...	...	103, 104, 110	
Phases through which humanity passed	...	...	...	...	36
Picts	...	...	...	...	94, 115
Piette, M.	...	...	...	...	55
Pile Dwellings	...	...	...	9, 72, 78, 82, 85	
Pit Dwellings	...	...	...	...	100
Pithecanthropus Erectus	...	...	...	...	19
Pithecoïd Features	...	...	...	...	36
Pleistocene Period	...	...	...	21, 34, 35, 41, 47	
Pliocene Period	...	...	...	19, 21, 27, 34, 36, 41, 47	
Podbaba Remains	...	...	...	...	32, 51
Pottery	...	...	...	...	83
Predmost Remains	...	...	...	...	32, 51
Prehistoric Development, Phases of	...	...	...	...	13
Prejudice against Evolution	...	...	...	...	5
Prejudice Overcome	...	...	...	...	7
Prestwich, Sir Joseph	...	...	...	...	7, 25
Primate Family	...	...	...	...	19
Problem of Race	...	...	...	...	66
Purgatory Hammers	...	...	...	...	6
Puy-Courny, Flints found at	...	...	...	...	23
Pygmy Implements	...	...	...	...	75
Pygmy Skeletons at Schweitzersbild	...	...	...	...	75
Quaternary Period	...	...	...	14, 28, 30, 47, 68	
Race Problem	...	...	...	...	66
Races Grouped	...	...	...	...	102
Red Indians	...	...	...	...	59, 103
Reindeer	...	...	...	...	54, 55
Reindeer of Thayngen	...	...	...	...	56
Reindeer Period	...	...	...	37, 38, 49, 50	
Reinhardt, Dr.	...	...	...	...	33
Relation of Tertiary Man to Development of Earth	...	...	...	...	26
Relics of Human Workmanship	...	...	...	...	22
Religious Belief	...	...	...	...	44

Remains of Human Beings	...	...	...	10, 31
Reutilian Stage of Eolithic Period	...	...	...	... 12
Rhinoceros	...	...	...	42, 48
Ridgeway, Prof.	...	...	...	67, 110
River-Drift Men	...	...	...	...12, 37, 42, 50
Rutot, M.	...	...	...	...12, 23, 24, 26
St. Acheul	...	...	...	... 39
Salmon, Prof.	...	...	...	... 49
Schipka (Moravia) Remains	...	...	...	32, 51
Schoetensach, Dr. Otto	...	...	...	... 34
Schwalbe	...	...	...	50, 67
Schwartz, Prof.	...	...	...	... 26
Schweinfurth	...	...	...	26, 29
Schweitzersbild Skeletons of Pygmies	...	...	...	... 75
Scotch Superstitions	...	...	...	... 6
Scraper	...	...	...	... 39
Sergi, Prof.	...	...	...	23, 26, 52, 64, 83, 95
Sharpening of Flints	...	...	...	... 27
Shell Mounds	...	...	...	... 78
Slowness of Advance	...	...	...	... 46
Smith, Mr. Worthington	...	...	...	...24, 25, 40, 43, 61, 100
Social Life during Palcolithic Period	...	...	...	43, 49, 57
Sollas, Prof.	...	...	...	24, 100
Solutré Remains	...	...	...	... 52
Solutrean Stage of Palcolithic Period	12, 37, 38, 49, 51, 54, 61			
Somaliland	...	...	...	... 67
Sordes Remains	...	...	...	51, 67
Souterrains	...	...	...	... 100
Speech	...	...	...	43, 59
Spy Remains	...	...	...	...31, 33, 35, 36
Stone Age	...	...	...	... 10
Stone Implements	...	...	...	...5, 22, 37, 38, 46, 48, 49, 54, 72
Stonehenge	...	...	...	97, 98
Stone Monuments	...	...	...	... 89
Straight-haired Men	...	...	...	... 102
Strepyian Stage of Paleolithic Period	...	...	...	... 12
Tasmanians	...	...	...	11, 23, 27, 43, 44, 53, 81, 106
Taubach Remains	...	...	...	... 32
Tertiary Man	...	...	...	9, 22, 23, 26, 28, 47
Tertiary Period	...	...	...	14, 15, 21, 23, 47
Tests of Flints	...	...	...	... 39
Thanes	...	...	...	42, 46
Thayngen, Drawing of Reindeer	...	...	...	... 56
Thenay, Flints found at	...	...	...	8, 22, 26
Theory of the Middle Ages	...	...	...	... 5
Thurnam, Dr.	...	...	...	... 93
Tierra del Fuego Inhabitants	...	...	...	... 78

Tilbury Remains	...	...	...	...	32, 50
Traditions	...	...	...	...	4
Trepanned Skulls	...	...	...	...	99
Turner, Sir W.	...	...	...	15, 47, 71, 114	
Vatican Museum	...	...	...	...	6
Veddahs	...	...	...	...	31, 43
Vernau, M.	...	...	...	...	52, 68
Vézère Man	...	...	...	33, 34, 35, 36, 48	
Villeneuve, M.	..	...	...	...	64
Virchow, Prof. Rudolph	...	...	...	...	9, 18
Walcott	...	...	...	...	47
Wavy-haired Races	...	...	...	...	102
Weapons	...	...	...	...	46
Windle, Dr.	...	...	...	24, 26, 77, 92, 97, 100	
Woolly-haired Races	...	...	...	...	102
Workshop Floors	...	...	...	...	57
Yahgans	...	...	...	...	43, 78, 81
Yellow Races	...	...	...	...	103
Zoological Congress (Leyden) 1894	...	...	...	...	18

THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

AN INITIAL FINE OF 25 CENTS

WILL BE ASSESSED FOR FAILURE TO RETURN
THIS BOOK ON THE DATE DUE. THE PENALTY
WILL INCREASE TO 50 CENTS ON THE FOURTH
DAY AND TO \$1.00 ON THE SEVENTH DAY
OVERDUE.

NOV 15 1933

DEC 8 1933

JAN 20 1943

MAR 31 1947

FEB 25 1938

MAY 12 1947

FEB 8 1939

18 Jan 5 1948

3 Apr 5 1948

NOV 21 1939

1948

NOV 23 1951 LU

NOV 29 1939

FEB 14 1940

19 1940 M

18

1941

YB 09392

280865

GN 743
MR

UNIVERSITY OF CALIFORNIA LIBRARY

